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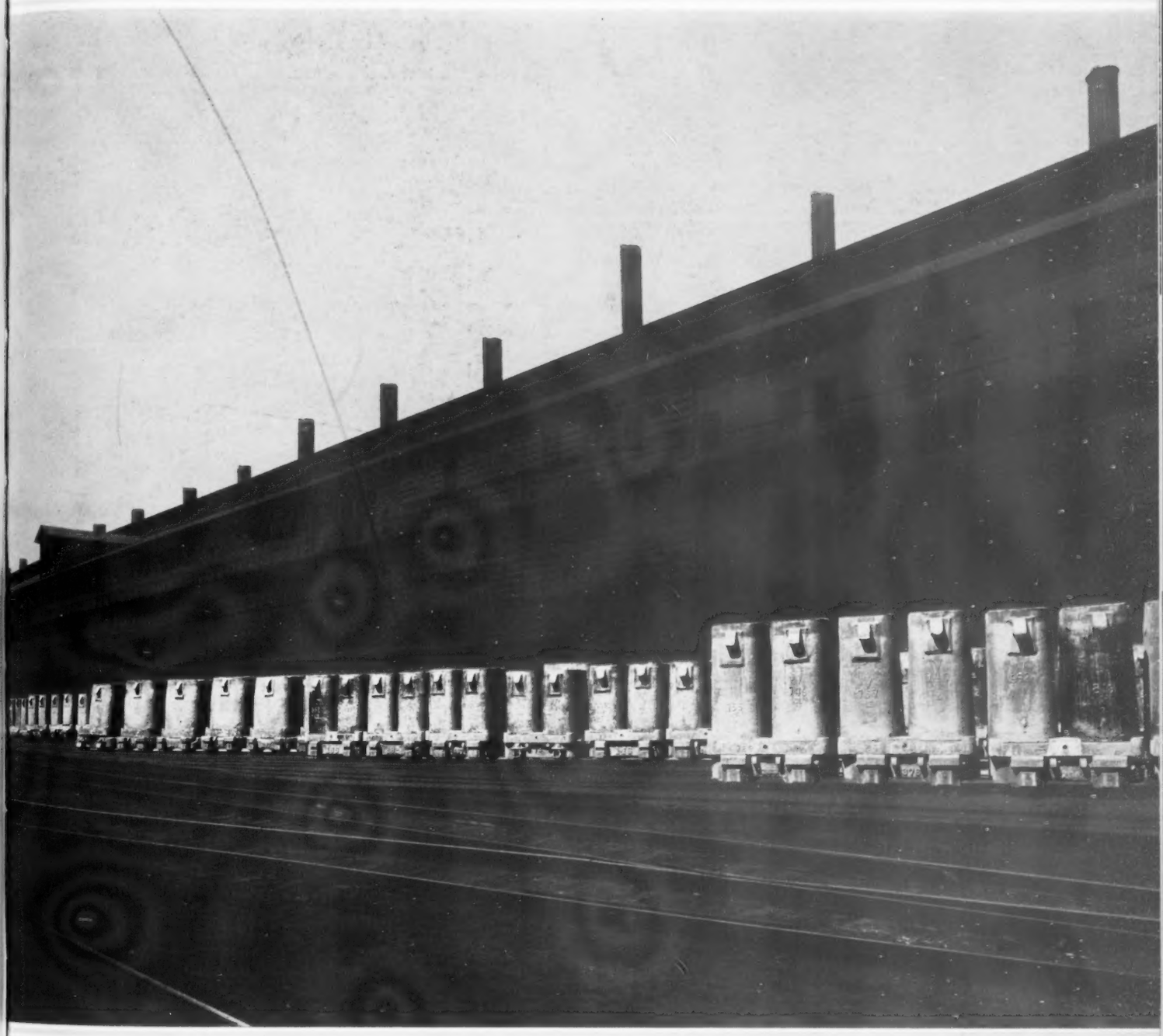
STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

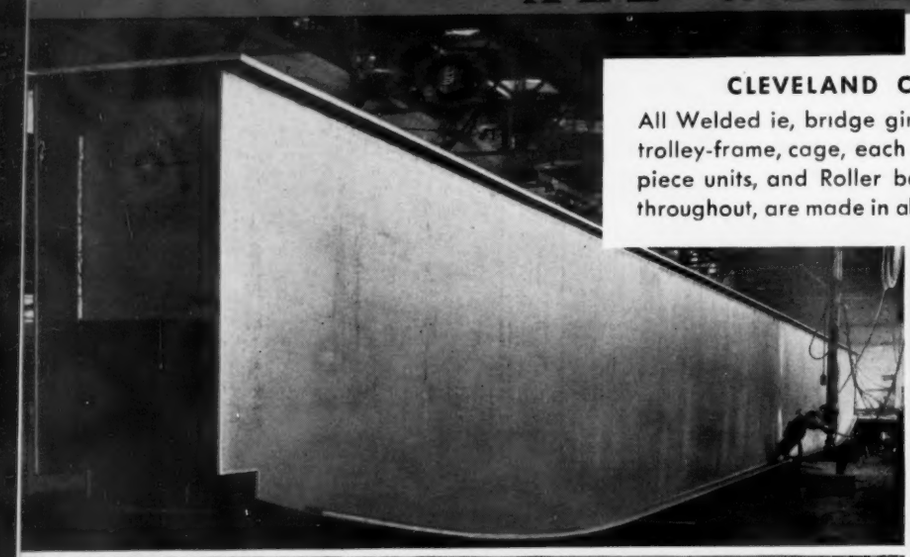


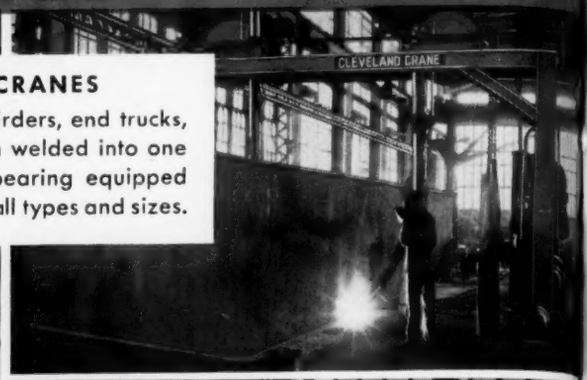
VALLEY MOULD & IRON CORP.

General Office: HUBBARD, OHIO

Western Office: Chicago, Ill.

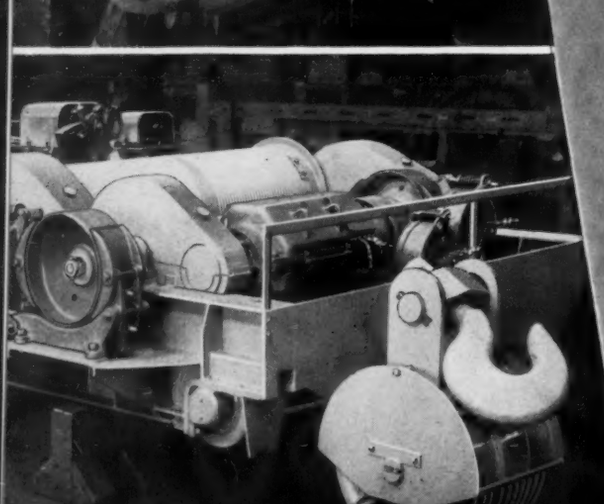
CLEVELAND CRANES
ALL WELDED

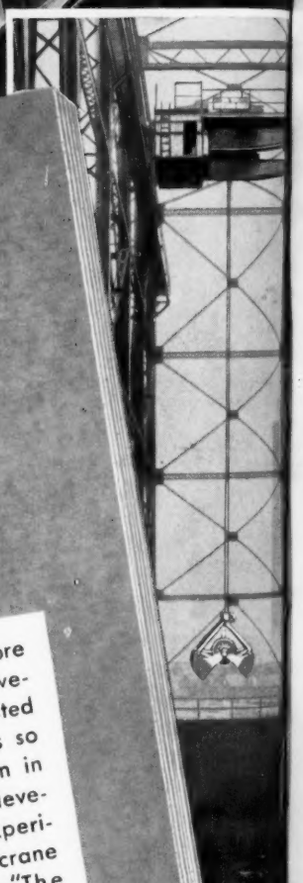


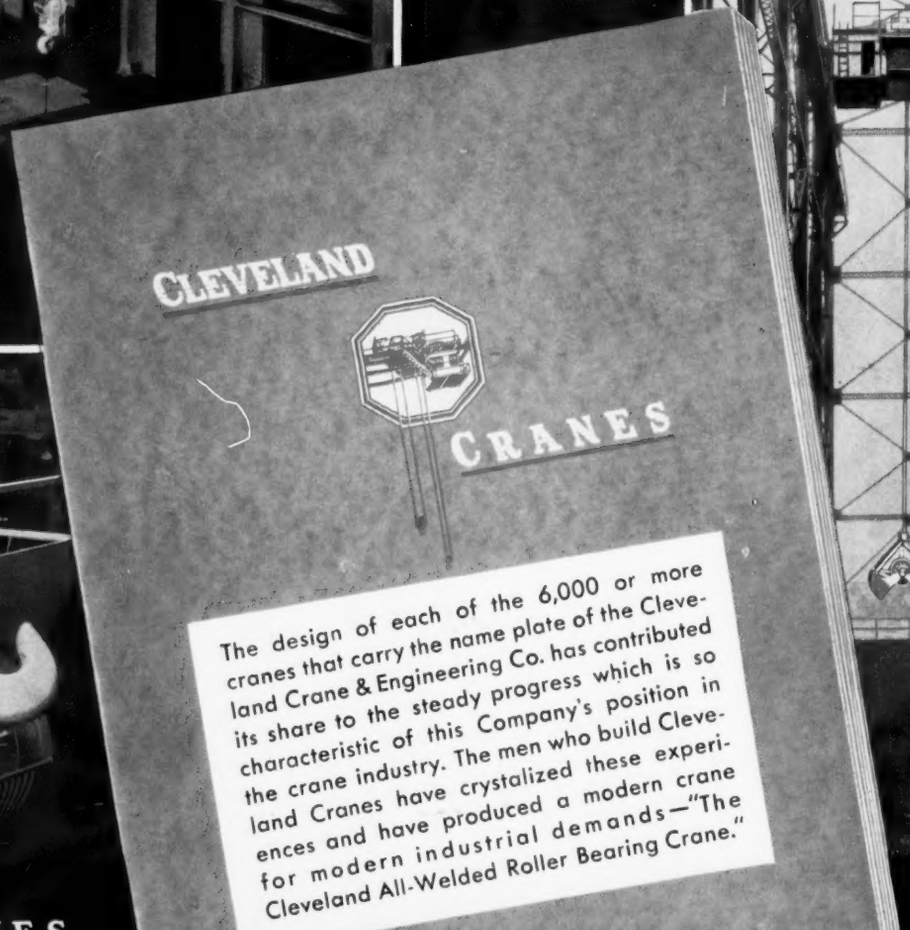


CLEVELAND CRANES

All Welded ie, bridge girders, end trucks, trolley-frame, cage, each welded into one piece units, and Roller bearing equipped throughout, are made in all types and sizes.



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The design of each of the 6,000 or more cranes that carry the name plate of the Cleveland Crane & Engineering Co. has contributed its share to the steady progress which is so characteristic of this Company's position in the crane industry. The men who build Cleveland Cranes have crystalized these experiences and have produced a modern crane for modern industrial demands—"The Cleveland All-Welded Roller Bearing Crane."

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Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Vote May Show Trend

To the Editor:

I was interested in "Industrial Engineer's" letter on the British Trade Disputes and Trade Union Act in STEEL, June 20, and the inference that John L. Lewis rather fears application of something of the sort in this country.

If the experience of the past is any criterion of the future, Mr. Lewis need not fear such a law in America. In England laws are enforced and there is no question about it. In the United States they are enforced only sometimes, when the political situation makes it advisable for the politicians in power.

Remember the sitdown strikes in Detroit and elsewhere? Where was the law enforcement? Where they were enforced, as in Ohio, the governor who preserved the peace has been the target of the CIO ever since.

Should the labor situation bring some sort of control, along the lines of the British law, for instance, the CIO can blame itself for having its wings clipped. The American public will stand just so much of the sort of thing Mr. Lewis has been abetting and then it clamps down and makes itself felt. Apparently the CIO has passed its meridian and is going down hill. It is mighty hard to reverse the direction of travel when the decline starts.

The elections this fall probably will throw some light on the matter. The workers who have been intimidated into signing up and paying dues to save a broken head will not vote with the gang and in the secrecy of the voting booth will show what they think of the Lewis movement. There are a lot of the intimidated, too.

AUTOMOBILE WORKER

Detroit.

It Could Have Been Worse

To the Editor:

Now that the late, and unlamented, congress has adjourned business can rest for a time and feel that the worst is known, for the present. Congress is to be commended in one respect, for the bills it did not pass, as shown in the resume in STEEL, June 20.

While it did interfere with business in a good many respects, it was less severe than its predecessor and it refused to do anything on many crack-brained proposals, such as government ownership of the steel industry and various embargoes on foreign sales.

What a luscious plum ownership of the steel industry would be for the politicians on the one hand and the CIO on the other. Just where prices would go if costs were considered under government operation is difficult to imagine. Steelworkers would become subjects of double slavery, to the political bosses and to the organized labor bosses.

Probably after the fall elections the completion of congress will be changed sufficiently to preclude any consideration of such a move. Advance indications of repudiation of Lewis and the CIO, as shown in the Pennsylvania primaries, give hope of a better balanced membership.

But, anyway, we know where we stand for a little time and that may give business courage to go ahead, at least to a limited degree.

STEELMAKER

Johnstown, Pa.

Never Too Old if Competent

To the Editor:

We have given recognition to the value of employes who have been with us 25 years or more by holding a service banquet for these men the last two years and presenting them a 25-year service pin. (STEEL, June 13, page 17).

In our particular business, experience is of tremendous importance and we know definitely that our men who have been on the payroll for 25 years or more are much more valuable than the younger men, but we also wish to pay tribute to the loyalty of these men who have found our relations with them sufficiently satisfactory to have been content to stay with us that length of time.

In the May issue of our *F-B NOTES* is a tabulation of the number of men employed by us according to age groups and over half of them are more than 40 years of age. Since the tabulation of these figures, it has been necessary for us to reduce the number of our employes and therefore if we were to re-draw these charts, I am sure they would show a much larger percentage of older men and longer service than at the time these figures were compiled.

A great deal has been said about industry's indifference to hiring men who have reached the age of 45. This does not apply with our company, as we have no maximum hiring age and any man who has had the necessary experience and is in good health can come with us even though he is 60 or 70 years old.

A. S. REDWAY

Vice president,
Farrel-Birmingham Co. Inc.,
Ansonia, Conn.

It's "mud in your eye" if that hose bursts

A typical example of Goodrich improvement in rubber

LOOKING straight up like this, you put your faith in that three-inch Goodrich hose that's carrying a stream of genuine Oklahoma mud. They say in the oil fields that if that hose ever burst, people in the next state would find spots on their vests and mucky globules down the backs of their necks. That hose carries a "mud-pressure" of 1600 pounds (nearly a ton) on every little square inch of inner surface. (But the hose won't burst.)

It's pressure enough to force that mud down a pipe a few inches wide, extending sometimes over a mile, sometimes nearly two miles, into the earth. At the bottom a whirling bit that looks like a dragon's tooth bites and claws away dirt and rock to be carried back up again by the return flow of mud.

Depths of oil wells were once limited by strength of the hose. Goodrich engineers, working with oil companies and makers of drilling equipment, developed hose made of rubber, fabric, and steel wire, a hose that's flexible yet stands the deepest drilling with safety and plenty of margin to spare.

And the same sort of research goes into *every* Goodrich product. This means that when *you* buy any kind of hose, belt or any other mechanical rubber goods YOUR GOODRICH DISTRIBUTOR offers you a product that gives you extra performance, one that invariably *saves your time and money.*

Specify Goodrich, and please write us if for any reason you can't get Goodrich products conveniently and promptly. The B. F. Goodrich Co., Mechanical Rubber Goods Division, Akron, Ohio.

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ALL *products problems* IN RUBBER

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

Vol. 102-No. 26 **June 27, 1938**

READER COMMENTS 7

AS THE EDITOR VIEWS THE NEWS 11

NEWS
- Low Inventories Presage Early Reflection in Mill Operations 13
- United States Equipment Builders Suffer by Mexican Oil Seizure 15
- Jones & Laughlin Enters Wire Rope Field 16
- Steel Prices Reduced; Chicago, Birmingham Differentials Out 17
- Steel Exports Down 7 Per Cent in May 18
- Mallable Founders' Society Elects Officers 18
- Steelworks Operations for the Week 19
- Men of Industry 20
- Obituaries 21

MIRRORS OF MOTORDOM 23

WINDOWS OF WASHINGTON 27

EDITORIAL—Let's Help Amend the Wagner Act! 29

THE BUSINESS TREND
- Rate of Industrial Activity Continues To Improve 30
- Charts and Statistics 31

TECHNICAL
- Forgings for Pumps 32
- Gas Immersion Heating 35
- Electroplaters Turn to Research for Shop Problem Solutions 37
- Metallic Resistors Withstand High Temperatures 44
- Long Turnings Shredded 50

PROGRESS IN STEELMAKING
- Mass Charging 38

MATERIALS HANDLING
- All on One Floor 39

HEAT TREATING
- Dam Chains 48

NEW METAL PRODUCTS 51

METALS AND ALLOYS
- Design Is Keynote 52

WELDING
- Refrigerator Shells 55

INDUSTRIAL EQUIPMENT 58

MARKET REPORTS AND PRICES 63
- The Market Week 64

BEHIND THE SCENES 74

CONSTRUCTION AND ENTERPRISE 82

INDEX TO ADVERTISERS 88

PRODUCTION · PROCESSING · DISTRIBUTION · USE

A TIMKEN Product

THAT HAS STARTLED THE WORLD

Drilling rock with TIMKEN Rock Bits in one of the world's largest copper mines. Note spare TIMKEN Bits in carrier on floor

Drilling holes in rock for blasting used to be done by means of steel drill rods with cutting edges forged on the ends. They had to be kept sharp by reforging —a constant source of expense. Then came the TIMKEN Rock Bit—a radically new tool embodying the principle of the safety razor—to revolutionize rock drilling. There's no reforging with TIMKEN Rock Bits. When a bit becomes too dull to drill, it is simply unscrewed from the rod and a new one put on—a matter of seconds. Drilling costs have in many cases been cut in half. You will appreciate what this means in large mines and quarries and on big construction projects where thousands of holes—many of them 15 to 20 feet deep—are drilled in solid rock every day. Can you think of a better investment for the bit user? The space available here does not permit going into detail regarding the many advantages of this remarkable rock drilling tool. You'll find the complete story in the Timken Rock Bit Booklet. Write for a copy.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

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TIMKEN

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STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ LATE Friday announcement of reduced prices on steel products, effective immediately, clarifies a price situation which had become confused. Its most significant feature, aside from the reduction (p. 17), is the elimination of differentials hitherto existing between Pittsburgh and Chicago and Birmingham. It is an effective response to the demand in certain high government places for lower steel prices. . . . STEEL'S survey of inventories (p. 13) reveals steel stocks on hand at consuming plants are low in most cases. The situation favors an immediate acceleration in buying in the event of any upward shift in consumption rate. . . . Steel output (p. 19) increased one point last week to 28 per cent of ingot capacity, second rise in two weeks. Sharp advances (p. 68) feature scrap prices.

• • •

Oldsters Valuable

A well-known manufacturer of machinery (p. 7) reports men who have been on the payroll for 25 years or more are much more valuable than younger men. More than half of its men are aged 40 or more. The company takes on qualified men though they be 60 or 70. . . . The new wage-hour act is of vital interest to all employers. An analysis (p. 27) reveals the new setup it will provide for permitting further government regulation of industry. . . . Indications at Washington are that the antimonopoly investigation of the new economic commission (p. 27) soon will get under way. . . . Eleven manufacturers of industrial rivets and the Institute of Tubular-Split and Outside Pronged Rivet Manufacturers have been given a cease and desist order (p. 21) by the federal trade commission.

• • •

Oil Seizure Diverts Trade

Completion of a new plant at Muncy, Pa., marks entry into the wire rope fabricating field (p. 16) by Jones & Laughlin Steel Corp.; the plant is expected to be in commercial production about July 1. . . . Since expropriation of foreign-owned oil properties in Mexico, American makers of oil field and refinery equipment have suffered the loss of much business (p. 15) already on their books or in prospect. Much of this now is going to Germany, in exchange for Mexican oil. . . . The President's commission to study British labor disputes act and Swedish labor relations (p. 81) includes well-known representatives of the steel producing and metalworking industries. . . . Exports of industrial machinery (p. 81) show a healthy gain over a year ago.

• • •

Melting Soft Metals

Government requirements continue to provide much work for the metal producing and metalworking industries and in many instances are of an exacting character. Examples are the shafts for pumps on the Colorado river aqueduct (p. 32) and the spillway gate chains (p. 48) for the dam at Fort Peck, Mont. Material selection and heat treatment required special attention in these jobs. . . . Gas immersion heating is one of the newer methods for melting soft metals. Such heaters with thin walls (p. 35) promote speed in heat transfer and bring other economies. . . . By a recently developed system (p. 38) entire charge is placed in the open-hearth furnace at one time; increased furnace output and decreased production costs are said to result. The system requires removable furnace fronts.

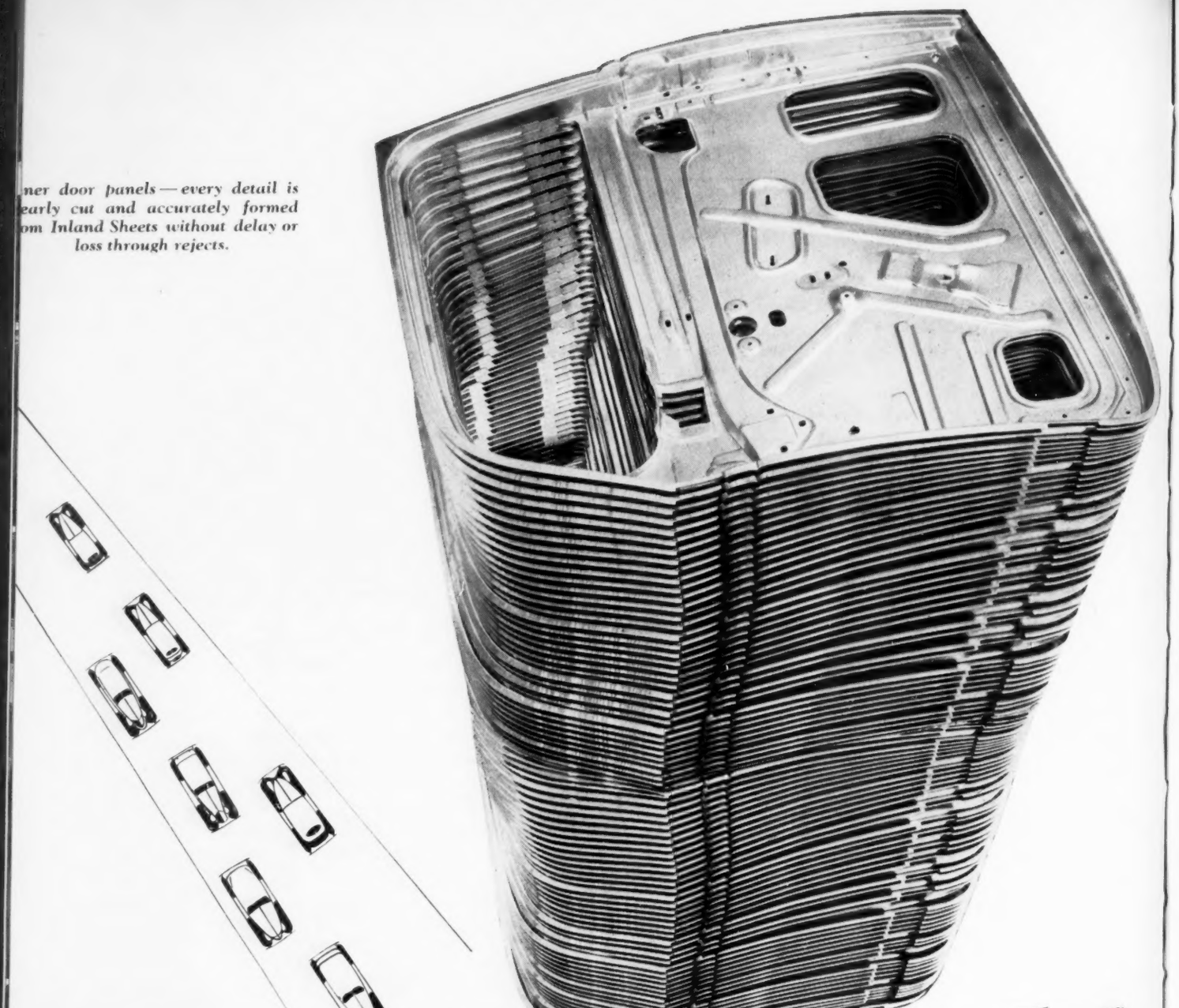
• • •

Better New Products

New metal products (p. 51) reflect striking improvements. A new gas range has valves that are concealed when not in use; it also has built-in electric cooker. A new typewriter is designed for quieter operation and maximum protection against dust. Through selection of materials, a new trenching machine (p. 52) represents a new high in strength and capacity per pound of weight. Welded steel refrigerator cabinets, by correct design and careful fabricating procedure, develop no defects (p. 55) after porcelain enameling. . . . Recently developed metallic resistors (p. 44) give remarkable service at temperatures of 2900 degrees Fahr. and higher. . . . At one plant (p. 50) savings are effected by three ring shredders which cut long turnings into shorter lengths.

E. L. Shaner

ner door panels — every detail is early cut and accurately formed om Inland Sheets without delay or loss through rejects.



"Million-tuplets"

From INLAND Cold Rolled Sheets

Along with the streamlining of automobile bodies, Inland has streamlined steel production, too. This term aptly describes what Inland has accomplished for users who require the highest possible degree of uniformity in cold rolled sheets with closely aligned mill control over chemical, physical, and surface characteristics.

At Inland's Indiana Harbor plant today a new continuous strip mill is nearing completion. But it represents only a phase of the development. Serving it, as well as Inland's 76" continuous mill installed in 1932, are open hearths and a new blast furnace—a completely new laboratory controlled line-up of steel-making equipment which operates with the rhythmic precision of a single machine.

Whether you're forming ash trays or car bodies, in quantities of thousands or millions, the unsurpassed uniformity of Inland Cold Rolled Sheets offers you today's best assurance of speedy production and quality output.

INLAND STEEL CO.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Low Inventories Presage Early Reflection in Mill Rates When Upturn Comes

DETROIT

■ STOCKS of steel in auto plants here generally are at a level considerably below normal, even taking into consideration the 50 per cent drop which production has experienced this year, compared with last.

While July 1 is normally the low point as far as inventories are concerned, the exhaustion of steel supplies this year in some cases has gone far beyond this point. For example, the float which one producer maintains is estimated at only one-tenth the amount to be expected on the basis of present assemblies.

Another estimate places the backlog of steel at Buick at the lowest figure in five years. Buyer for one of the leading parts plants here reveals that with the exception of only two items, supplies of steel have never been lower in the history of the company.

At Packard, inventories of steel are reported considerably below the normal level. Packard, it will be recalled, bought heavily last summer and has taken a long time to bring inventories down to the present figure. However, in the past week, the company is understood to have made several small buys for delivery July 25 on 1939 model production.

Chrysler divisions likewise have worked inventories down to a low point, as has Fisher Body. Some recent releases on steel were made by Fisher Body to finish out the balance of the run on 1938 models, reflecting the unexpected strengthening of sales in the past four weeks. Ford has a large tonnage of semifinished steel available, but with the steel plant idle for a protracted period may be soon feeling the pinch on some items.

RECENT slight increase in the steel production rate is based largely on the fact that inventories at consuming plants have shrunk to low proportions, thus causing an increased demand for steel, particularly in small lots for quick shipment. STEEL's survey of existing inventories in principal industrial districts, presented herewith, indicates definitely that inventories after holding down purchases over many months finally have ceased to be a brake on new business

Summing up the situation, it appears inventories are in extra-healthy condition leading up to buying for 1939 models, which is expected on a fairly large scale after the first of August.

Buys probably will be based on automobile assemblies at about the rate held this year — 225,000 cars per month — although there are some who are definitely bullish on the outlook for 1939. They maintain the rapid tailspin of business this year is the best augury for an equally rapid ascent this fall.

Certainly it is a fact there have been no important purchases of steel for automobiles since last fall, and with inventories now depleted to an abnormally low point, the steel industry may yet see automobile companies once again lead the way out of the recession woods.

STOCKS LOW, ESPECIALLY PLATES AND SHAPES

NEW YORK

■ Stocks here have been reduced to where any appreciable upturn in demand for manufactured steel soon would be reflected in increased buying from mills. This is particularly true in plates and shapes, which usually are ordered to close specifications for work on hand, and hence, even under more favorable general business conditions, are not stocked in large volume.

In the lighter products, response might not come quite so promptly, due to heavy manufactured stocks. This is now being reflected in tin plate and in flat steel for refrigerators and certain other household equipment.

Nevertheless, manufacturing has been so limited over recent months that even these fabricated stocks loom not too important. A refrigerator manufacturer reports completed units now are moving out at a rate of four for every one being built.

Jobber stocks are admittedly below normal, except for a few lines, including possibly galvanized sheets. Prospects for sustained improvement would stimulate building up of these stocks, contrasting with present scattered replacement buying.

Small consumers of pig iron have

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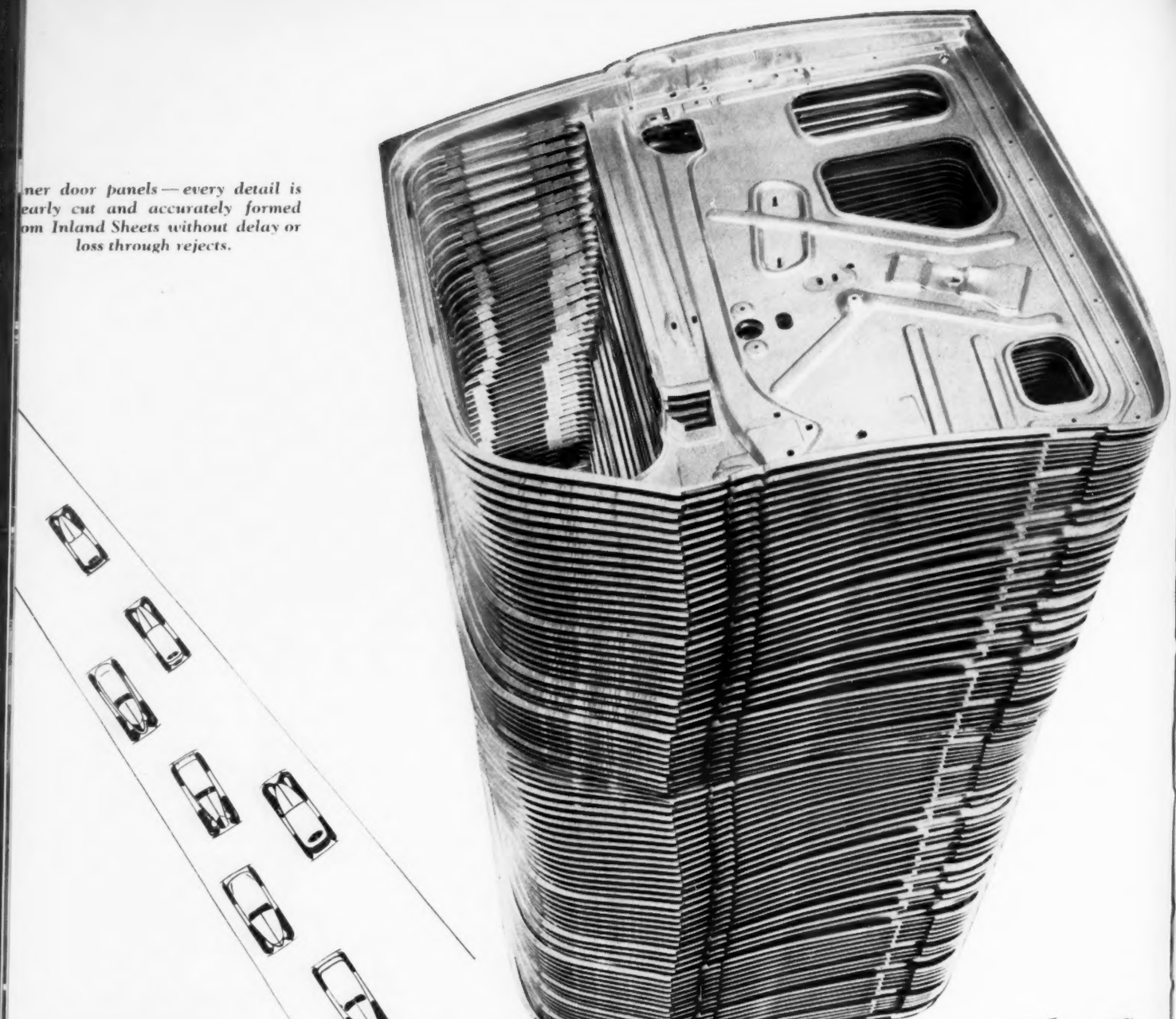

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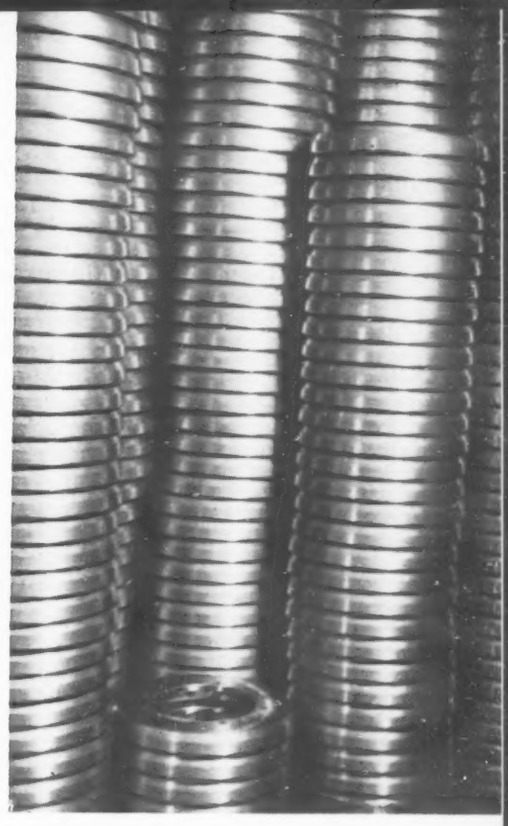

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Jobber stocks are admittedly below normal, except for a few lines, including possibly galvanized sheets. Prospects for sustained improvement would stimulate building up of these stocks, contrasting with present scattered replacement buying.

Small consumers of pig iron have

no stocks and while the larger ones have fair supplies such stocks would not last long should any real upturn develop. Eastern consumers of ore are well stocked and it would take more than a modest increase in steel production to bring early improvement in their buying.

In general the trade does not anticipate any marked gain in business before September.

CONSUMPTION STILL ABOVE STEELMAKING ACTIVITY

PHILADELPHIA

■ Steel consumption in the Central Eastern area has continued considerably above the level of steelmaking activity ever since the slump started last year. While no exact operating average of steel consuming industries is available, it is estimated the range is 30 to 50 per cent with the general average around 35 per cent.

This means consumers' inventories are at an absolute minimum and even a minor lift in business would result in replacement buying. For examples, supplies of one user of cold-rolled strip are only 3 per cent of the total a year ago; a plate consumer had 6000 tons on hand early last fall but stocks now are down to sub-normal.

While inventories of unfabricated material often are down to minimum there is no denying that stocks of finished products are heavy in some instances. These include stoves, radios and other products requiring light stampings. Stocks of certain heavier items, such as range boilers, are also said to be fairly substantial.

Warehouse stocks are fairly well down to normal as indicated by the character of replacement buying. Pig iron stocks, except in the hands of pipemakers, are unusually low. Some consumers, ordinarily buying several hundred tons at a time, now are taking no more than a carlot and as little as 5-ton truck loads.

RESERVE STEEL STOCKS ARE BELOW NORMAL

ST. LOUIS

■ Reserve stocks of both raw and finished materials are not large, and in numerous instances, particularly among smaller producers and distributors, are less than in many years.

Pig iron inventories are universally light, as demonstrated by steady flow of orders for prompt shipment, often for rush delivery. Heavy steel users are carrying stocks much below those on hand at this time last year. Railroad equipment makers, who usually order only enough for specific orders, have less steel on hand than on any similar date in a decade, and what they have is to apply on business booked. Stove manufacturers are carrying small stocks of finished products though recently there has been some increment to inventories in preparation for fall and winter.

Warehouse and jobbing interests report normal inventories, with assortments complete. Farm implement manufacturers have no excessive supplies of raw materials, and only moderate accumulations of finished machinery. However, there are still large stocks in hands of country dealers, much of which has been shipped on consignment. Jobbing foundry inventories are generally below average.

Recent weeks have witnessed heavy liquidation of dealer scrap stocks, particularly in the case of country dealers. In some instances steel mills have heavy stocks of scrap, but generally consumer scrap inventories are of moderate size. Some mills have also been accumulating ingots, but none of those contacted reported burdensome stocks.

Mill stocks of finished steel range from slightly below to 10 per cent above normal for this time of year.

STEEL CONSUMPTION IS HIGHER THAN PRODUCTION

CHICAGO

■ For several months consumption of steel has been running ahead of production. Consumers have drawn on inventories until stocks are far below normal. While naturally there is considerable variance, some inventories are known to be at the lowest point in recent years.

No great inroads have been made during the past six months on many inventories which were already at a low point, at the same time there has been little or no replenishing.

In most lines, buying has been only for immediate needs, and consumers, finding curtailed production rates of mills have made possible especially rapid delivery, have been loath to enlarge inventories.

Present scanty inventories, though, do not necessarily mean early buying will result. Manufacturers, particularly of retail items, are reported to have on hand sufficient stocks of finished products.

Lowest inventories are believed held by foundries, whose pig iron stocks in some instances have been estimated as sufficient for as little as 30 days.

SUBSTANTIAL REDUCTIONS MADE SINCE JAN. 1

CLEVELAND

■ Substantial reductions in consumers' inventories have been apparent in practically all lines since Jan. 1. This is reflected in the wide variety of specifications entered on mills' books recently. While individual tonnages are small, they cover a wide range. Quick delivery usually is requested.

A survey indicates inventories on all products, with the possible exception of tin plate, are subnormal.

Volume of semifinished material on the mills' floors also is said to have been substantially reduced, although this is not so generally true as in the case of consumers. However, recent advances in the steel operating rate has been attributed in part to the effort of some mills to fill in depleted stocks.

Jobbers, who generally were more heavily stocked than consumers six months ago, have effectively set their houses in order. Inventories are evenly divided at lower levels.

INCOMING ORDERS CHANGED TO MORE GENERAL NATURE

PITTSBURGH

■ One reason cited by the trade in this district for the generally better feeling is that incoming orders have changed from largely fill-in items to more general orders indicating inventories are scraping bottom.

Reducing of inventories has been a tedious process, but there is no doubt the bottom has been reached.

New steel buying is to fill orders already received by manufacturers and the rate of orders now will approximate the rate of demand, which undoubtedly has been higher recently than the steel production rate would indicate.

Net result is a firmer demand picture than has been seen for many months, although, of course, it still is far from satisfactory.

INVENTORIES SO LOW ANY DEMAND WOULD REFLECT

CINCINNATI

■ Inventories of steel consumers, both raw materials and finished parts, are so low that any upturn in demand for their products will bring almost instant reflection in the steel market.

Furnace stocks of pig iron are fairly heavy but foundries have bought little so far in 1938, depending on material at hand and on contracts, some of them several times renewed. These contracts are now rapidly running out. Foundries now buy iron as needed, in carloads and for rush shipment.

Conditions with the sheet mills are nothing like those at the year-end. Consumer stocks are low. For several months an unusually large proportion of orders was for fill-in purposes. Parts and materials overhanging the automotive industry, mill representatives report, are not large.

Jobbers expect a quick reaction

to any upturn in buying by the ultimate consumer. Stocks of jobber customers are the lowest in several

One manufacturer who customarily carries 8 to 10 tons of certain warehouse materials now demands rush truck delivery of a 5-foot length, as need arises.

INVENTORIES MAKE POSSIBLE HIGHER OPERATING RATE

BIRMINGHAM

■ That southern mills have been able, thus far this year, to operate at a rate substantially higher than that of the national average, is due largely to satisfactory status of inventories. Stocks generally are sufficient only for day-to-day needs.

Practically every specification is being bought as need arises, and any upturn in buying necessarily will reflect immediately in increased business for mills.

This is true, not only in the case of roofings, wire products and smaller items in hands of jobbers and dealers, but of bars and structurals in the yards of fabricators and tank builders who did not purchase in quantity earlier when there was some doubt as to price trends.

JOBBERS' STOCKS PARED 20 PER CENT SINCE JAN. 1.

BUFFALO

■ Inventories of steel consumers are in a healthy state. Mills have been gearing production to orders and steelworks operations should respond immediately to any improvement in buying.

Jobbers report stocks have been pared approximately 20 per cent since Jan. 1, and supplies now are just about normal for current demand.

Warehouses have been cutting down on their buying from mills during recent months. Some sellers at the start of the year had ample supplies for six months ahead, others for three months. In such cases buying was stopped in order to bring inventories in line with demand. At present stocks on hand are no longer considered excessive even with demand still restricted.

Sheets and plates continue in fairly heavy supply while bars and shapes, along with specialty items, appear to have met the best support possible.

■ Ludlum Steel Co.'s natural color motion pictures were taken by the Kodachrome process and not Technicolor, as recently stated in these columns. So far as can be learned, the new color films of the United States Steel Corp. are the first industrial films to have been processed by Technicolor.

United States Equipment Builders Suffer by Mexican Oil Seizure

■ EXPROPRIATION of foreign-owned oil properties by the Mexican government last March and the uncertainty felt by operators preceding actual seizure has sharply curtailed United States exports of petroleum equipment to Mexico.

If Mexico is able to retain and operate the properties, it is probable much equipment trade which formerly came to the United States will be diverted to other countries. Mexico, heavily in debt and lacking capital, now is trading expropriated oil for petroleum equipment and other machinery.

The condition seems to be aggravated by the attitude of the oil companies involved. They appear to be in a huff over the expropriation proceedings and show no disposition to adjust themselves to the new Mexican picture, and are making no proposals to counteract the overtures coming from other directions.

May Aid Companies

However, Mexico's precarious financial condition eventually may work to aid the oil companies regain control of their properties and thus return to the United States the equipment trade lost by expropriation.

Nevertheless it is believed this latest evidence of the uncertainty of investments in Mexico will tend to direct future oil developments to other countries more friendly toward American capital.

At the time of expropriation an impressive improvement program in connection with the Mexican properties was under way. Contracts for oil field and refinery equipment in the amount of about $2,500,000 had been placed with American fabricators. These immediately were cancelled.

In addition, plans were under way for two new refineries to be established in Mexico at an outlay of about $5,000,000. More such work, all of which would have come to the United States, was contemplated. These plans now are dead and will not be revived unless the companies involved regain possession of the properties.

How much United States shipments of petroleum and gas well drilling apparatus, well and refinery machinery and other petroleum equipment have declined is indicated

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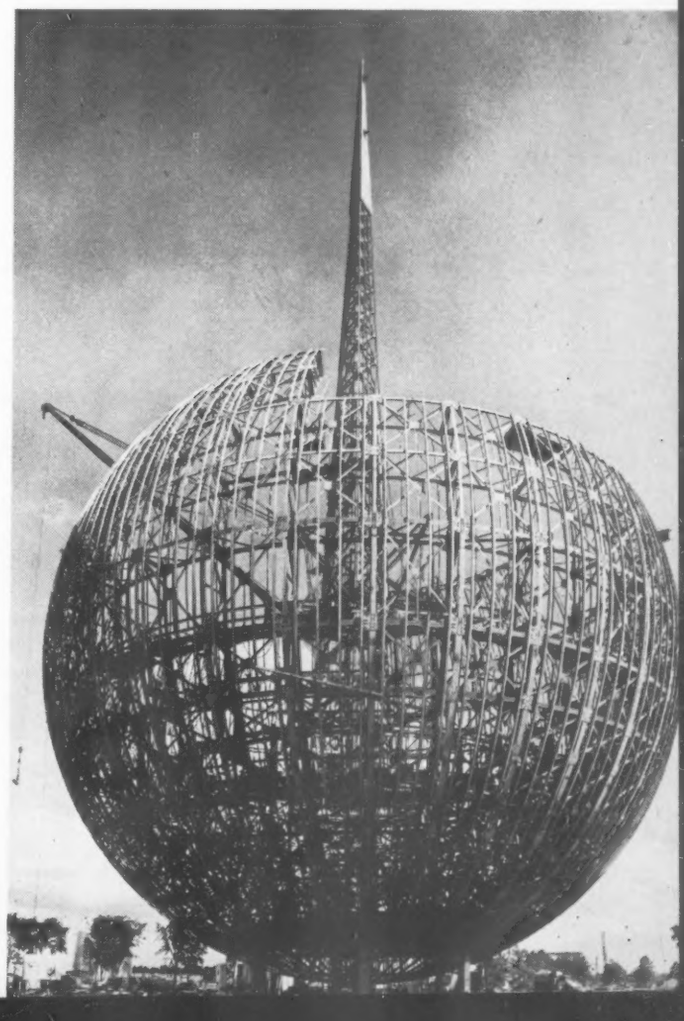
Require 6500 Tons of Steel



■ **Perisphere on the New York World's fair grounds, with trylon towers in the background, had reached this stage last week. Approximately 6500 tons of steel, fabricated and erected by American Bridge Co., is required for the two units**

by the following department of commerce figures:

	1937	1938
January	$41,621	$49,638
February	100,251	54,733
March	144,630	34,758
April	351,317	8,866
	$637,819	$147,995

In 1937, such exports to Mexico amounted to $1,408,898; in 1936, to $1,156,598.

Reported deals between Mexico and other countries providing for exchange of oil for machinery and equipment have caused considerable concern to equipment and machinery builders in this country. During the last several years the United States has sold almost all the machinery Mexico has bought.

The Mexican government only recently completed a deal for the sale of 10,000,000 barrels of oil to Germany over the next six months. Sixty per cent of the payment will be in German materials and machinery.

During the next six months the Mexican government can get only slightly more than 2,000,000 barrels of oil from wells operated before expropriation. The remaining 8,000,000 barrels necessarily will be expropriated oil.

For New Plants

Among projects for which Mexico plans to obtain German machinery are the Rio Grande hydroelectric plant, a new paper plant, a caustic soda plant, the Tampico sugar mills and several petroleum plants.

A New York firm, Davis & Co., is acting as the Mexican government's agent in the deal with Germany.

Other countries, notably Italy and Japan, are known to be interested in the possibility of obtaining Mexican oil, probably on a similar basis. Should the Mexican government retain and operate the expropriated oil properties, many such deals probably would be executed and American equipment and machinery builders would suffer accordingly.

However, the oil companies entertained a strong hope the muddled situation will drag out for a considerable time. They reason Mexico will not be able to make compensation for the expropriated properties and that the oil companies will be able to maintain strong claims until a more friendly government is established.

They point to Mexico's heavy indebtedness. The internal agrarian debt is estimated at $400,000,000. The external debt, in default both as to principal and interest payment, exceeds $970,000,000. Already the Mexican government has confessed its inability to pay even the annual interest on the external debt.

By the expropriation decree Mexico became liable to make compensation for the oil properties, valued at several hundred million dollars. It also added other liabilities—reduced tax revenues, curtailed economic profits, disrupted commerce, strained relations with other nations, increased governmental expense, and vastly augmented responsibilities—all of which will work to its extreme disadvantage.

Another essential although intangible loss was the technical skill and executive ability furnished by the American companies. Day after the expropriation decree was issued offices of the oil companies were occupied by persons designated by the Mexican government authorities. Americans and other foreign families were forced to leave the producing and refining zones.

Seize Many Properties

Companies named in the expropriation decree and whose properties were seized were:

Compania Mexicana de Petroleo "El Aguila," S. A. (Mexican Eagle Oil Co. Ltd. [Shell]); Compania Naviera de San Cristobal, S. A.; Compania Naviera San Ricardo, S. A.; Huasteca Petroleum Co. (Standard Oil of Calif.); Sinclair Pierce Oil Co.; Mexican Sinclair Petroleum Corp.; Stanford y Compania Sucesores S. en C.; Penn Mex Fuel Co. (Sinclair); Richmond Petroleum Co. de Mexico (Standard of Calif.); California Standard Oil Co. of Mexico; Compania Petrolera El Agwi, S. A. (City Service); Compania de Gas y Combustible Imperio; Consolidated Oil Co. of Mexico (Sinclair); Compania Mexicana de Vapores San Antonio, S. A.; Sabalo Transportation Co.; Cacalilao, S. A.; Clarita, S. A.

This action climaxes two decades of sporadic harassment of the foreign oil interests by Mexican politicians. First step in this program was nationalization of sub-soil or mineral rights in 1917, impairing full rights to previously acquired property. Later the government entered into competition with the companies, usurped possession in some cases, and thus acquired various proven oil acreages. Without payment, the government took over the lush Poza Rica area, discovered in 1930 after extensive and expensive work by Mexican Eagle Oil Co.

Meanwhile the government encouraged and supported syndicalism and permitted flagrant abuses of power.

These events have tended to discourage some companies and direct their efforts toward countries more receptive to development. Mexican oil production—and equipment purchases—began to dwindle. From a daily average of 530,000 barrels during 1921, output dropped until in 1937 it averaged about 130,000 barrels daily.

J. & L. Enters Wire Rope Field

■ COMPLETION of a new, modern plant at Muncy, Lycoming county, Pa., marks the entry of the Jones & Laughlin Steel Corp., Pittsburgh, into the wire rope fabricating field. The latest unit in the company's current expansion and development program, the new plant is in the preliminary production stages. Operations of a commercial scale are scheduled to begin about July 1. Production and sales of wire rope will be conducted by the newly organized Gilmore Wire Rope division (see Page 20) with headquarters at Muncy.

Included in the new line will be wire rope for oil country use, for general construction uses and for industrial applications. Wire for rope production will be drawn at the company's Aliquippa, Pa., works.

Muncy, a town with about 3000 population, is co-operating actively to lend a colorful atmosphere to the formal opening of the new wire rope division early in July. Local interests, with the help of the townspeople, have landscaped the plant effectively and made other improvements including the construction of driveways and docks with crushed marble from the local quarry. This, of course, adds much to the appearance of this new plant.

GM Schedules 215,000 Units, July to October

■ Announcement was made late last week by General Motors Corp. that schedules for new car production from July to October, inclusive, call for building 215,000 cars and trucks, including initial run on 1939 models. Relating this total to the balance of the industry, an output of 537,500 is indicated for this four-month period, compared with 1,375,590 in the same period last year.

Annual inventory and model change period will start in General Motors plants at the end of this month and will be staggered over the period of the next two months in the different plants, with all plants back in production during September.

Plants will close on an average three weeks longer than last year which had the shortest changeover period in the history of the industry.

As in former years, arrangements will be made in states which have no unemployment insurance acts in force to help employes who need money advances to tide over the lay-off period.

Steel Prices Reduced; Chicago, Birmingham Differentials Out

■ PRICE reductions, effective immediately, of $3 a ton on semifinished steel and $3 to $5 a ton on most finished steel products—the reduction depending upon the basing point — were announced late last week by Carnegie-Illinois Steel Corp., Pittsburgh.

Featuring the new schedule is the setting up of identical prices for the various products at Pittsburgh and Chicago. A simultaneous reduction of prices by Tennessee Coal, Iron & Railroad Co. involved larger cuts and brings Birmingham base quotations to a parity with those at Pittsburgh and Chicago.

It was stated by Carnegie-Illinois that the lowering of prices to approximately the same level as those in effect prior to 1928 was done to meet competitive conditions and in the hope that such reductions would stimulate a demand for steel products. Setting up of identical base prices for Pittsburgh and Chicago was explained as the outcome of increased production facilities and greater diversification of products in the Chicago district.

The new market on rerolling billets, blooms, slabs and sheet bars is $34, Pittsburgh, Chicago and Birmingham, off $3 a ton. Hot-rolled carbon steel bars are down $4 a ton at Pittsburgh, $5 at Chicago and $7 at Birmingham to 2.25c. Plates and shapes are off $3 at Pittsburgh and $4 at Chicago at 2.10c. Concrete reinforcing bars have been reduced further, following a cut earlier last week, the total drop being $8 at Pittsburgh and $9 at Chicago to 2.05c for new billet material.

Flat-rolled steel has been cut again, hot-rolled sheets and strip now being off $3 a ton at Pittsburgh and $5 at Chicago in addition to the $2 reduction which accompanied changes in classifications and differentials on these products a short time ago. The new market is 2.15c for hot-rolled strip and sheets.

Sheet piling has been marked down $4 at Pittsburgh and $6 at Chicago to 2.40c.

The new base prices at Pittsburgh, Chicago and Birmingham, together with reductions from former levels follow:

	New base prices	Reduction, Dollars Per Ton at Pitts-burgh	Chi-cago	Birm-ing-ham
Hot-rolled bars	2.25c	4.00	5.00	7.00
Plates	2.10c	3.00	4.00	6.00
Shapes	2.10c	3.00	3.00	6.00
Hot-rolled strip	2.15c	3.00	5.00	6.50
Hot-rolled sheets	2.15c	3.00	5.00	6.00
Concrete bars (billet)	2.05c	8.00	9.00	9.00
Piling	2.40c	4.00	6.00	....
Billets, slabs, sheet bars	$34	3.00	3.00	3.00

Cites Communistic Tint Of CIO Organizers

■ CIO organizers with communistic records were sent into all three of American Rolling Mill Co.'s plants in three different states, according to O. H. Murray, assistant to president, that company, in commenting on SWOC's charge with the Cincinnati office of NLRB that an Ashland, Ky., patriotic organization was dominated by the company.

The board's complaint, while not detailed, was regarded by Mr. Murray as referring to the Clarence Fields post of the American Legion, Ashland, which exposed the communistic and jail record of George Powers, then CIO organizer at Ashland, where he had incited several strikes and a riot. Following publication of the statement Powers was transferred from Ashland by CIO, according to Mr. Murray.

Born in Russia

Similarly, said Mr. Murray, a John Steuben who had several assumed names and who appears to be Itsok Ryshak, born in Russia and not a citizen of the United States, was put in charge of CIO activities at American Rolling Mill Co.'s Butler, Pa., plant. While at Butler he was convicted and fined for destroying railroad property at Youngstown, O., and CIO paid his fine. This man, said Mr. Murray, had an extended record as a communist and, when his record was exposed at Butler, he was removed by CIO.

A few days later, according to Mr. Murray, CIO sent T. Louis Majors to organize the company's Middletown, O., plant. CIO transferred him from Middletown when it was revealed there that he had been run out of Newcastle, Pa., for spreading communistic propaganda while acting as a CIO organizer.

Steel Houses Atom Smasher

■ **This 18 x 33-foot steel shell will house the University of Minnesota's atom-smashing equipment. The cylindrical structure, fabricated by Chicago Bridge & Iron Co., Chicago, is of butt-welded construction and designed to withstand a pressure of 100 pounds per square inch**

BAR IRON ASSOCIATION RENEWS AMALGAMATED PACT

Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers have renewed their sliding scale wage agreement for one year, beginning July 1. Terms are identical with those of the 1937-38 agreement, which expires midnight, June 30.

In the sliding scale arrangement, under which the Amalgamated has operated for more than 40 years, average selling price for bars for the preceding month is the basis for wage rates for the succeeding month. Card rate for boiling, bar and 12-inch mills is $2.45; for guide and 10-inch mills, $2.55, both unchanged for the past year.

Negotiations leading to the pact's renewal were between the Western Bar association, represented by S. C. Leonard, secretary treasurer, and the Amalgamated, represented by J. Frank Bennett, president. Neither SWOC nor CIO were represented.

Steel Exports in May Down 7%

■ EUROPEAN purchases continue to taper and exports of iron and steel products, excluding scrap, in May declined from the April total. May shipments were 166,319 tons, valued at $10,899,772, compared with April shipments of 179,250 tons valued at $12,061,586, a drop of 7 per cent. In May, 1937, exports, excluding scrap, were 331,103 tons valued at $19,186,363, the highest attained to that time, though this record was exceeded in July and August last year.

Scrap shipments in May totaled 374,320 gross tons valued at $5,520,068, compared with 309,952 tons valued at $4,846,323 in April and 638,108 tons valued at $13,708,219 in May, 1937.

Pig iron provided the largest export tonnage, 33,931 tons, a loss of 10,431 tons from the April total. Tin plate shipments in May were 9078 tons, which was 8894 tons less than in April. Fabricated plates, steel ingots, shapes and galvanized sheets showed substantial gains.

Leads in Shipments

Japan took 31,944 tons of the 33,931 tons of pig iron exported in May and 12,902 tons of the 14,815 tons of ingots. That country led in total shipments, which also included 3053 tons of steel bars, 1625 tons of wire rods and 1421 tons of car wheels.

Canada was second with 19,488 tons, compared with 11,857 tons in April and 40,717 tons in May, 1937.

In five months this year exports, excluding scrap, totaled 967,411 gross tons valued at $64,554,898, compared with 1,063,678 tons valued at $68,087,976 in the corresponding period of 1937. In the first five months of 1929 exports totaled 1,156,900 tons valued at $86,301,614.

Scrap exports for five months totaled 1,636,247 gross tons valued at $26,384,363, compared with 1,652,363 tons valued at $32,533,492 in the same period in 1937. Japan led with shipments of 690,106 tons, followed by the United Kingdom with 349,450 tons; Italy, 193,143 tons; the Netherlands, 100,673 tons; and Germany, 89,968 tons.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	May 1938	April 1938	Jan. thru May,'38
Pig iron	33,931	44,362	191,141
Ferromanganese and spiegeleisen	45	5	159
Other ferroalloys	28	83	550
Ingots, blooms, etc.:			
Not containing alloy	10,752	7,757	108,035
Alloy, incl. stainless	4,063	17	4,711
*Steel bars, cold fin.	1,263	2,213	6,943
Bars, iron	18	89	699
Bars, concrete	890	1,085	7,109
Other steel bars:			
Not containing alloy	9,155	8,839	52,955
Stainless steel	26	16	198
Alloy, not stainless	543	292	2,023
*Welding rods, electric	56	70	435
Wire rods	2,098	2,829	13,575
Boiler plate	2,118	753	3,856
Other plates, not fab.:			
Not containing alloy	10,277	21,215	87,643
Stainless steel	18	91	132
Alloy, not stainless	466	564	1,763
Skelp, iron or steel	683	2,752	6,189
Sheets, galv. iron	259	465	1,549
Sheets, galv. steel	6,595	3,284	26,809
Sheets, "black" steel:			
Not containing alloy	13,483	14,130	83,620
Stainless steel	88	57	1,049
Alloy, not stainless	141	232	1,931
Sheets, black iron	589	318	2,485
Strip steel, cold-rolled:			
Not containing alloy	1,912	1,412	10,416
Stainless steel	20	11	190
Alloy, not stainless	7	14	79
Strip steel hot-rolled:			
Not containing alloy	2,138	1,928	14,733
Stainless steel	18	34	60
Alloy, not stainless	12	1	33
Tin plate, taggers' tin	9,078	17,972	76,387
Terne plate	233	249	2,211
Tanks, except lined	1,628	2,030	13,820
Shapes, not fabricated	12,670	5,720	41,860
Shapes, fabricated	1,442	2,809	16,657
Plates, fabricated	9,607	1,269	12,738
Metal lath	57	133	466
Frames and sashes	66	88	611
Sheet piling	374	171	1,753
Rails, 60 lbs.	1,188	5,572	31,285
Rails, under 60 lbs.	251	785	2,872
Rails, relaying	15	766	3,500
Rail fastenings, etc.	182	451	2,959
Switches, frogs, etc.	90	157	796
Railroad spikes	135	117	817
R. R. bolts, nuts, etc.	107	70	382
Boiler tubes, seamless	1,735	1,524	6,288
Boiler tubes, welded	1,180	46	1,273
Pipe:			
Smls. cas'g & oil-line	4,605	5,988	27,158
Do welded	1,269	483	8,876
Smls. black, ex. cas'g	639	628	2,961
Pipe fittings:			
Mall. iron screwed	334	257	1,306
Cast iron screwed	84	156	777
Pipe and fittings for:			
Cast iron pressure	1,006	941	4,579
Cast iron soil	756	705	3,946
Pipe, welded:			
Black steel	992	726	4,400
Black wrought iron	195	173	857
Galvanized steel	856	622	4,755
Galv. wrought iron	188	87	1,120
Pipe and fittings:			
Riveted iron or steel	3	46	911
Wire:			
Plain iron or steel	1,567	2,322	8,374
Galvanized	2,193	1,723	8,299
Barbed	2,456	2,443	8,261
Woven wire fencing	161	140	662
Woven wire screen cloth:			
Insect	26	13	77
Other	194	86	504
Wire rope and cable	362	359	1,690
Wire strand	34	91	437
Card clothing	19	....	23
Other wire	494	414	2,344
Wire nails	1,788	1,354	6,520
Horseshoe nails	47	73	511
Tacks	17	21	91
Other nails, staples	445	390	1,371
Bolts, machine screws	739	671	3,532
Castings:			
Gray iron, semi-steel	297	326	1,426
Malleable iron	96	83	692
Steel, not alloy	237	130	587
Alloy, incl. stainless	58	74	283
Car wheels, tires, axles	2,092	1,794	8,677
Horseshoes and calks	40	2	49
Forgings, n. e. s.:			
Not containing alloy	258	1,048	3,398
Alloy incl. stainless	42	34	212
Total	166,319	179,250	967,411
Scrap, iron or steel	371,745	306,900	1,624,795
Scrap, tin plate	909	1,348	5,268
Tin plate circles, strips, cobbles, etc.	427	1,292	2,564
Waste-waste tin plate	1,239	412	3,620
Total scrap	374,320	309,952	1,636,247
GRAND TOTAL	540,639	489,202	2,603,658
Iron ore (gross tons)	25,646	4,403	30,493

*No distinction prior to 1938.

Malleable Group Elects Parker

■ MALLEABLE Founders' Society in convention June 16 and 17 at Greenbriar hotel, White Sulphur Springs, W. Va., elected as president Frank O. Parker, general sales manager, Acme Steel & Malleable Iron Works, Buffalo. John A. Wagner, president, Wagner Malleable Iron Co., Decatur, Ill., was named vice president; Robert E. Belt was re-elected secretary-treasurer. All 12 directors were re-elected.

Reports of committee activities and discussions of the industry's problems featured the meeting.

These included a paper, "Gating and Feeding," by Enrique Touceda, consulting engineer of the society, and another, "Annealing Furnaces, Fuels, Cycles, Costs," by James H. Lansing, the society's shop practice engineer. Mr. Lansing presented lantern slide illustrations and summary of a paper, "Malleables for Engineering Uses," prepared jointly with Mr. Touceda.

Homer M. Wright, metallurgist, Michigan Malleable Iron Co., Detroit, presented "Surveys of Pearlitic Malleables Covering Properties, Manufacture and Fields."

Discusses Cost Control

Mr. Wagner discussed methods his company uses in controlling production costs with volume changes. Anthony Haswell, vice president, Dayton Malleable Iron Co., Dayton, O., summarized wage differentials in the industry.

Enlargement of the society's publicity program was recommended by E. E. Griest, vice president, Fort Pitt Malleable Iron Co., Pittsburgh, and chairman of the society's new uses committee.

Arthur F. Jackson, president, Michigan Malleable Iron Co., Detroit, and retiring president of the society, stressed the value of handling technical work of the group in a co-operative way.

Auto Output in Dip

■ Automobile production last week was 40,918 units, compared with 41,790 the preceding week, according to *Ward's Reports*. In the corresponding week of 1937 output was 121,032. Comparisons:

	Week ended June 25	June 18
General Motors	16,950	18,175
Chrysler	6,095	6,195
Ford	13,810	11,810
All others	4,063	5,610

Monthly and yearly comparisons will be found on page 24.

PRODUCTION

■ BETTER production at the larger centers last week brought a rise of 1 point in the national operating rate to 28 per cent. In a number of areas there was a decline, adjustment to volume of orders, accumulations having been worked off.

Youngstown — Gained 5 points to 32 per cent, practically equal to the highest point this year, attained in April. Accumulated orders are being worked down, with 28 of 83 open hearths and all three bessemers in production. The rate this week is expected to go down about 2 points. In the following week resumption at the Brier Hill plant probably will bring a further increase.

Cleveland — Down 8 points to 23 per cent, following some curtailment at Lorain, bessemer capacity being substituted for open hearth.

Pittsburgh—Slight increase in activity by most producers caused a gain of 0.7 point to 24 per cent.

Wheeling—Increased 3 points to 38 per cent on resumption by one open hearth at a down-river mill.

Chicago—All producers but one made an increase in production to move the rate up 2½ points to 24½ per cent, the first rise in seven weeks.

New England—Off 10 points to 15 per cent, only one plant producing ingots. Two producers are scheduled to resume within 10 days, with a corresponding rise in rate.

Buffalo—Unchanged at 28 per cent, on a steady flow of small orders.

Detroit—Up 8 points to 29 per cent as one producer operated six open hearths the full week.

Central eastern seaboard—No change in the production rate at 27 per cent, with no change scheduled for this week.

St. Louis—Decline of 2.7 points to 36.6 per cent after remaining at 39.3 per cent for three weeks.

Birmingham, Ala.—Down to 42 per cent, a loss of 16 points, due to removal of two open hearths at the Ensley rail mill.

Cincinnati—With only three open hearths producing last week the rate fell 14 points to 14 per cent. Finishing mills are operating on ingot stocks at a better rate than open-hearth production.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended June 25	Change	Same week 1937	Same week 1936
Pittsburgh	24	+ 0.7	82	66
Chicago	24.5	+ 2.5	63.5	71
Eastern Pa.	27	+ 1	67	47
Youngstown	32	+ 5	29	80
Wheeling	38	+ 3	93	71
Cleveland	23	— 8	49	84.5
Buffalo	28	None	88	84
Birmingham	42	—16	83	58.5
New England	15	—10	92	80
Cincinnati	14	—14	86	80
St. Louis	36.6	— 2.7	93	†
Detroit	29	+ 8	99	100
Average	28	+ 1	74	71.5

†Not reported.

Officers Chosen by Electrical Engineers

■ American Institute of Electrical Engineers has elected as president Dr. John C. Parker, vice president, Consolidated Edison Co. of New York Inc., New York. Vice presidents elected include: Chester L. Dawes, Cambridge, Mass.; F. Malcolm Farmer, New York; A. H. Lovell, Ann Arbor, Mich.; F. C. Bolton, College Station, Tex.; Lester R. Gamble, Spokane, Wash. Directors elected for current term were: Leland R. Mapes, Chicago; Harold S. Osborne, New York; D. C. Prince, Philadelphia. W. I. Slichter, New York, was re-elected national treasurer.

These officers and the following hold-over officers will constitute the board of directors for the year beginning Aug. 1: W. H. Harrison, retiring president; C. R. Beardsley, New York; V. Bush, Cambridge, Mass.; F. Ellis Johnson, Columbia, Mo.; J. P. Jollyman, San Francisco; C. R. Jones, New York; W. B. Kouwenhoven, Baltimore; F. H. Lane, Chicago; A. M. MacCutcheon, Cleveland; L. N. McClellan, Denver; K. B. McEachron, Pittsfield, Mass.; M. J. McHenry, Toronto, Ont.; C. A. Powel, East Pittsburgh, Pa.; R. W. Sorenson, Pasadena, Calif.; I. Melville Stein, Philadelphia; Edwin D. Wood, Louisville, Ky.

Membership in the institute has grown to 16,078. Besides three national conventions and two district meetings, 1958 other meetings were held.

Steel Helps To Make Mountain Climbing Easy

■ **More than 180 tons of steel, 11,520 feet of 1⅞-inch cable, 11,200 feet of 1-inch wire rope and 11,200 feet of ⅞-inch wire rope were required for the Cannon Mountain tramway, just completed by American Steel & Wire Co., near Franconia, N. H. The tramway, which cost more than $200,000, will be dedicated June 28 in the presence of high officials of the wire company, New Hampshire and other New England states. Trams are constructed of Man-Ten steel with riveted and welded connections. Cables between landing points are 5410 feet long. Minimum breaking strength is 187½ tons, more than three times the heaviest load**

MEN OF INDUSTRY

■ H. B. SPACKMAN, since June, 1937, general sales manager, Lyon Metal Products Co., Aurora, Ill., has been promoted to vice president in charge of sales and advertising. Before joining the Lyon organization he was general sales manager, steel products division, United States Gypsum Co., Chicago.

♦

R. N. Miller has succeeded the late G. C. Merckel as purchasing agent, Norwood works, Allis-Chalmers Mfg. Co., Norwood, O.

♦

C. V. McKaig, vice president, United States Steel Corp., has been elected to the board of directors, American Iron and Steel institute.

♦

G. B. Child, for 18 years active in purchasing and cost reduction work, Buda Co., Harvey, Ill., and a director the past several years, has resigned.

♦

Irving L. Bambrick, 35 Congress street, Boston, has been appointed representative in the New England states for Acme Machine Products division, Serrick Corp., Muncie, Ind.

♦

William A. Irvin, vice chairman, United States Steel Corp., has been elected president of the Pennsylvania Society of New York. He succeeds J. Leonard Replogle.

♦

J. J. B. Rutherford, formerly of the research laboratory, United States Steel Corp., Kearny, N. J., has joined the staff of Babcock & Wilcox Tube Co., New York, as research metallurgist.

♦

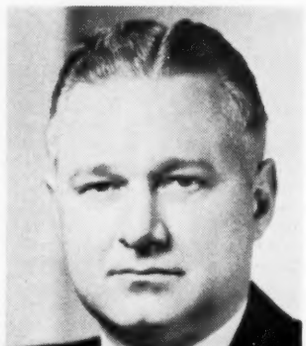
Charles A. Heil, district manager at Cleveland for the Carpenter Steel Co., has been elected chairman of the board, Aetna Rubber Co., Cleveland. He formerly was president of the company.

♦

Arthur R. Allard, works manager, South Philadelphia plant of Westinghouse Electric & Mfg. Co. will become vice president in charge of manufacturing, General Steel Casting Corp., Eddystone, Pa., and Granite City, Ill., effective July 1.

♦

Harmon V. D'Agostino has been named eastern manager for Designers for Industry Inc., Cleveland. His headquarters will be in the company's New York office, International building. He was formerly associated with the Philadelphia Electric Co., and later was a lighting and design consultant, specializing in commercial and institutional lighting.



H. B. Spackman

♦

W. W. Zahm, employed in the engineering and fabricating division of Bethlehem Steel Co., Bethlehem, Pa., the past 10 years, has been transferred to Cleveland as contracting engineer in the fabricating division.

♦

F. M. Rich recently resigned as blast furnace superintendent of the Buffalo works of Republic Steel Corp., to become affiliated with the Steel Co. of Canada Ltd. as superintendent of blast furnaces, Hamilton works, Hamilton, Ont.

Robert Gilmore

Who has been appointed general manager of the newly created Gilmore Wire Rope division (see page 16) of the Jones & Laughlin Steel Corp., Pittsburgh. His headquarters will be at Muncy, Lycoming county, Pa., where the company's new wire rope plant has been located. Mr. Gilmore formerly was president and general manager, Williamsport Wire Rope Co., Williamsport, Pa.

♦

F. L. McCauley, for a number of years a director of Marting Iron & Steel Co., Ironton, O., has been elected president, succeeding the late A. R. Johnson. In addition to filling vacancies on the board, directors discussed plans for winding up affairs of the company.

♦

Dr. Alan Morris, formerly research engineer, has been promoted to chief metallurgist, Bridgeport Brass Co., Bridgeport, Conn. He will be in charge of the physical and chemical laboratories as well as research activities. He has been with the company since 1923.

♦

Hiland G. Batcheller, president and director, Ludlum Steel Co., Watervliet, N. Y., has been appointed a director, New York Telephone Co. Mr. Batcheller is also president, Forging & Casting Corp., and chairman of the board, Wallingford Steel Co.

♦

Hyman Ledeen, 747 Warehouse street, Los Angeles, has been appointed sales representative in the lower part of California, the states of Arizona and New Mexico and the western part of Texas for the Struthers-Wells Titusville Corp., with plants in Titusville and Warren, Pa.

♦

Dr. C. F. Hirshfeld, chief of research, Detroit Edison Co., and past chairman and member, Engineers' Council for Professional Development, has been granted honorary degree of doctor of engineering by the University of Detroit. Citation says Dr. Hirshfeld "has led a movement to liberalize and humanize the engineering profession by advocating in it not only the highest technical knowledge and skill, but also a broad general culture and a sense of social and civic responsibility."

♦

F. S. Wilhoit, Cutler-Hammer Inc., Milwaukee, has been elected president, Milwaukee Association of Purchasing Agents. Other new officers are: Vice president, Theodore H. Schultheis, J. Rauschenberger Co.; secretary, E. H. Jones, E. R. Wagner Mfg. Co.; treasurer, E. J. Peters, Pittsburgh Plate Glass Co.; national director, H. A. Steffen, Wadhams Oil Co.; local director, C. E. Bradley, Loeffelholz Co.

♦

Dr. Robert F. Mehl, head of the department of metallurgy and director, metals research laboratory, Carnegie Institute of Technology, has been awarded the honorary degree of doctor of science by Franklin and Marshall college. The degree was presented with the follow-

ing citation: "Robert F. Mehl, a graduate of Franklin and Marshall college with the degree of bachelor of science, has made extensive contributions to the science of physical chemistry and by his many successful investigations of metals and alloys, has rendered extraordinary service to American industrial enterprise and American naval engineering."

♦

Walter E. Schutz, Perfex Corp., Milwaukee, has been elected president, Milwaukee Association of Industrial Advertisers, and not the Milwaukee Association of Purchasing Agents as inadvertently reported in STEEL, June 20, page 24. Prescott C. Ritchie, Waukesha Motor Co., has been elected vice president; James Tate, Delta Mfg. Co., secretary-treasurer, and Arnold Andrews, Bucyrus-Erie Co., South Milwaukee, director for three years.

♦

Newbold C. Goin has succeeded L. R. Botsai as sales manager of Westinghouse Electric & Mfg. Co.'s

Newbold C. Goin

gearing division, Nuttall works, Pittsburgh. Mr. Botsai was recently transferred to the sales managership of the company's small motor division at Lima, O.

Born in Lemont, Ill., Mr. Goin has been associated with Westinghouse since 1917. He has been employed as a field service engineer in the southeastern and central districts and since 1924 had been a salesman in the central district.

♦

Prof. Kenneth H. Donaldson has been appointed head of the department of metallurgical engineering, Case School of Applied Science, Cleveland. For the past few months he has been acting as temporary head of the department. Professor Donaldson has been at Case since 1921, and was promoted to professor of mineral industry in October, 1937. He is a member, American Society for Metals, Cleveland Engineering society, and is secretary, Cleveland section, American Institute of Mining and Metallurgical Engineers.

♦

Arthur W. Schuster, 1025 Granite building, Rochester, N. Y., has been appointed representative by Roots-Connersville Blower Corp., Connersville, Ind., for the distribution of turbine pumps in the west central part of New York state. Other representatives appointed are: John B. Foley Jr., 249 Erie boulevard, West, Syracuse, N. Y., to cover the northeastern section of New York state; F. S. Salchenberger, 211 Wacker drive, Chicago, to cover northeastern corner of Illinois as well as three counties in Indiana adjacent to Chicago, and B. J. Walter, 315 West Woodbridge street, Detroit, to cover southeastern section of Michigan.

DIED:

■ FREDERICK R. ANGELL, 67, since 1935 president, Northern Malleable Iron Co., St. Paul, Minn., in that city, June 10. He was identified with the malleable iron industry all of his business life. Before 1916 he was associated with the National Malleable & Steel Castings Co. at the Chicago and Indianapolis plants.

♦

John Alexander Wilson, 56, president, Wilson-Brown Inc., New York, at his home in Plainfield, N. J., June 13.

♦

Don Cole, 61, retired consulting engineer of Bendix Products Corp., South Bend, Ind., at his home in Evanston, Ill., June 18.

♦

Charles H. Jarmuth, 52, auditor, East Moline works, International Harvester Co., June 20 at his home in Moline, Ill., of injuries suffered in a fall.

♦

John S. Lynch, 48, superintendent, Union Drawn Steel Co., Massillon, O., in Massillon, June 19. He was with the company more than 35 years.

♦

Franklin Atwood Park, 70, vice president and chairman of the board, Singer Mfg. Co., New York, at his summer estate at Penzance Point, Woods Hole, Mass., June 17.

♦

Frank S. McCullough, electrical engineer and head of the testing department, Electric Controller & Mfg. Co., Cleveland, in that city, June 14. He had been associated with the company 25 years.

♦

G. Howard Burkholder, 50, sales manager, Dodge plant of Link-Belt Co., Indianapolis, in that city recently. He had been associated with the company 37 years, beginning his service as messenger boy in 1901 in Philadelphia.

♦

William H. Bell, 61, northwestern district service manager, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., at his home near Barrington, Ill., June 12. He had been in Westinghouse employ 39 years.

♦

George R. Boyce, 69, of A. M. Castle & Co., Chicago, in that city June 14. He became associated with A. M. Castle & Co. in 1912 and served as director and vice president of railroad sales for many years.

♦

A. B. Carson, 60, supervisor of the production bureau, Pittsburgh district order division, Carnegie-Illinois Steel Corp., at his home in Ben Avon, Pa., June 17. Mr. Carson was associated with Carnegie-Illinois and the Carnegie Steel Co. more than 40 years, holding various clerical positions until 1923 when he was named assistant general agent of the order and scheduling department in charge of bar products. He became manager of the production bureau in 1932 and in 1935 was appointed supervisor.

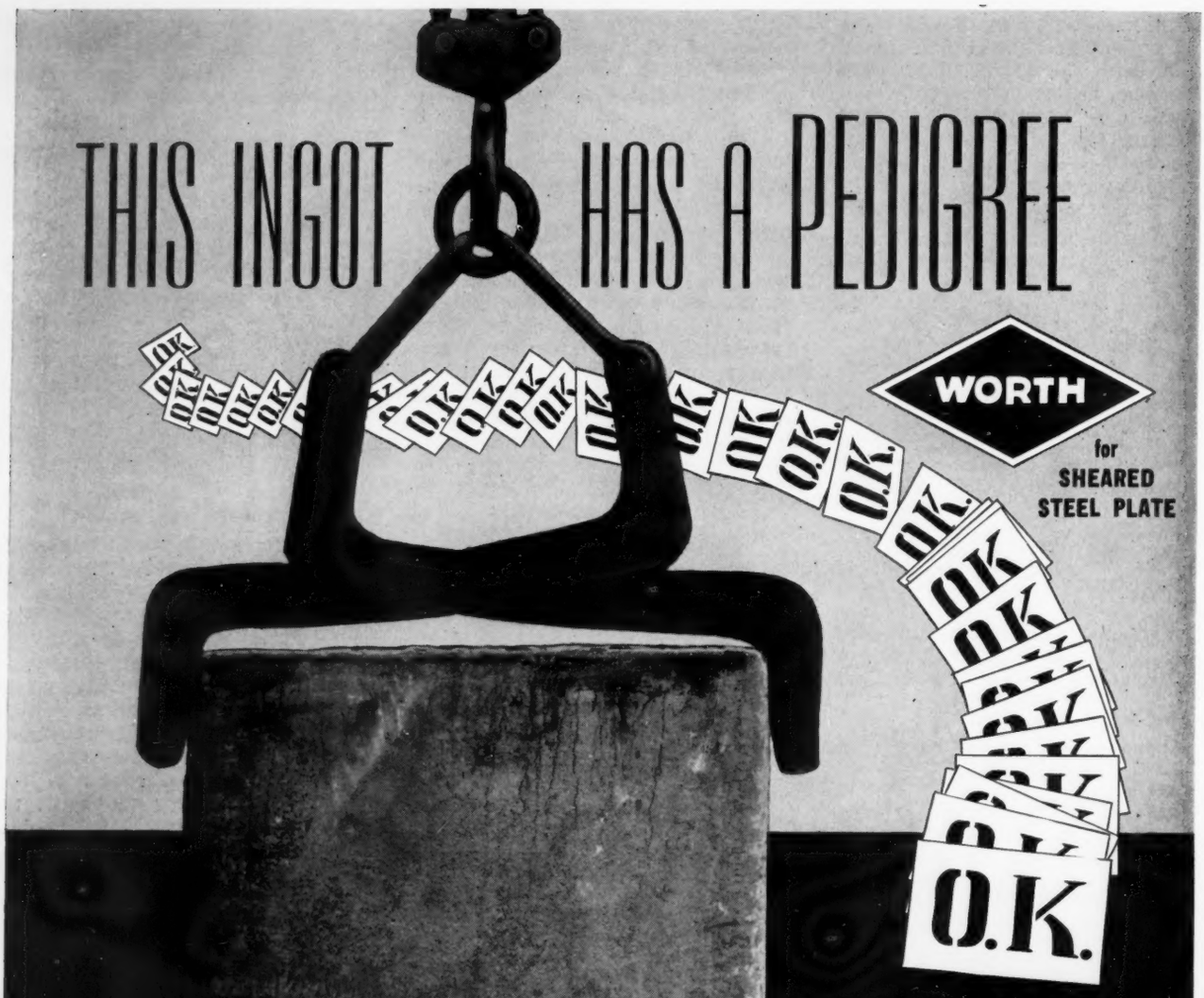
Rivet Makers Ordered To Avoid Price Fixing

■ Eleven manufacturers of industrial rivets and the Institute of Tubular-Split and Outside Pronged Rivet Manufacturers have been given a cease and desist order by the federal trade commission. The order prohibits fixing and maintaining uniform delivered prices, holding meetings to influence prices or similar actions. Respondent companies are:

Shelton Tubular Rivet Co., and Shelton Tack Co., both of Shelton, Conn.; Tubular Rivet & Stud Co., Boston; Judson L. Thomson Mfg. Co., Waltham, Mass.; Milford Rivet & Machine Co., Milford, Conn.; Chicago Rivet & Machine Co. and Manufacturer's Belt Hook Co., both of Chicago; National Rivet & Mfg. Co., Waupun, Wis.; Townsend Co., New Brighton, Pa.; John Hassall Inc., Brooklyn, and J. W. Coombs Mfg. Co. Inc., Fort Washington, Pa. The order is also directed against William Fleming, Jr., president of the institute, which has headquarters at Waupun, Wis.

The order provides that lawful gathering, compilation and distribution to the trade of statistics, including discounts, net prices, terms and conditions of sale and other particulars of closed transactions is not forbidden.

THIS INGOT HAS A PEDIGREE



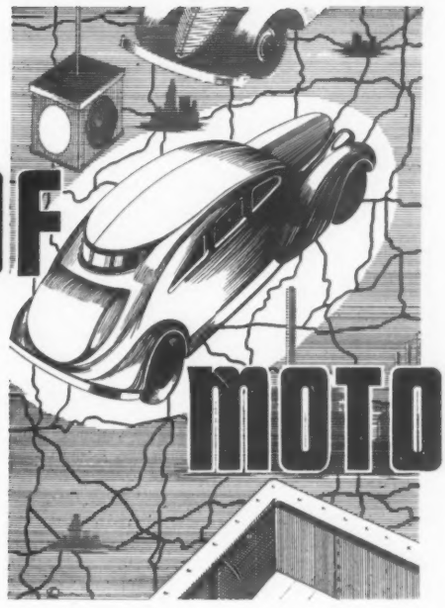
A background of careful supervision, accurate check and grueling test . . . a long series of O.K.s earned by strict adherence to rigid standards. Routine in our plant and the secret of the perfect uniformity of WORTH SHEARED STEEL PLATE

WORTH STEEL COMPANY CLAYMONT, DEL.

CALL THE NEAREST REPRESENTATIVE

New York, N. Y., Wm. C. Dickey • Pittsburgh, Pa., McKee-Oliver, Inc. • St. Louis, Mo., Hubbell & Sharp • San Francisco, Calif., W. S. Hanford • Boston, Mass., Edward H. Lloyd • Chicago, Ill., Theo. L. Dodd & Co. • Houston, Texas, The Corbett-Wallace Corp. • Seattle, Wash., National Steel Sales, Inc. • Los Angeles, Calif., Ducommun Metals & Supply Co. • Cleveland, Ohio, E. F. Bond • Detroit, Mich., H. L. Sevin • Portland, Oregon, National Steel Sales, Inc. • Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.

MIRRORS OF MOTORDOM



DETROIT

■ BULLISH factors continue to dominate the motor scene, although the current situation perhaps is best described by the words of a local metals broker who says there is "a million dollars' worth of confidence and about ten cents' worth of business."

Nevertheless auto assemblies continue on a contraseasonal trend and are expected to hold well into July around the 40,000 per week mark. One explanation of this strength is that dealers have been deliberately depleting their inventories, ordering perhaps one car from the factory for every two sold. Finally they have come to the point where they have had to step up their orders from the assembly plant and the result has been an improvement in automobile production at a time when normally it is tapering off.

Dressing Up Used Cars

Reticence of dealers to stock new cars readily can be appreciated after studying a recent report compiled by the National Automobile Dealers association which surveys the progress of 412 representative dealers over the past five years. It shows that in four of the past five years, new and used car selling combined has resulted in a net loss, with income from service, parts and accessory departments providing the cushion to prevent dealers from operating in the red.

Dealers in various locations are recognizing the importance of a flourishing service business, especially in periods like the present when new car sales are 40 per cent below last year's rate. Thus more than one dealer has built up his service crew to the highest point in years, and has put them to work renovating used cars which the dealer has bought in the open market.

Technique of giving effective beauty treatments to used cars has been so vastly improved through the efforts of such organizations as the Used Car Appearance Reconditioning institute—a free educational service for dealers sponsored by equipment manufacturers — that many dealers are able to doll up old cars attractively and sell them at a profit.

BY A. H. ALLEN
Detroit Editor, STEEL

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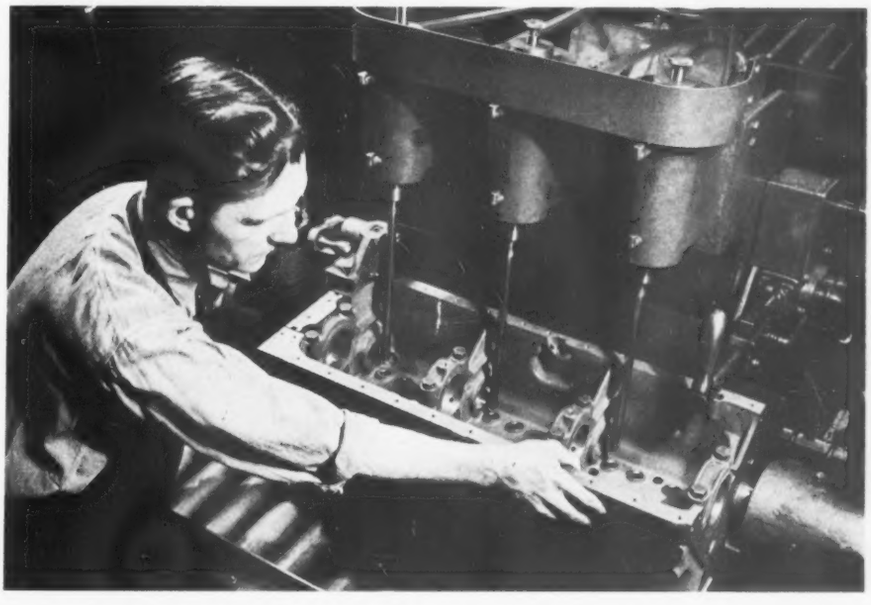
■ VIRTUAL exhaustion of steel inventories by automobile builders (see p. 13) is another favorable sign that a strengthening in the steel-making rate is not far off. Not in a good many years, if ever before, have steel backlogs been as low as they are in some plants here.

However, as yet there are no indications of any steps being taken to

Tamping Valve Guide Holes, 200,000 Blows a Minute



■ **Mirror-like finish inside valve guide holes is obtained by this operation at Oldsmobile factory. Small parallel rollers similar to short needle bearings are loosely locked in the ends of the rods shown in photo. A revolving cam inside the rod forces the rollers outward. They strike the side of the hole at a rate of more than 3300 blows per second, pounding down microscopic irregularities which, if allowed to remain, might pierce the film of lubricating oil and permit metal-to-metal contact**

correct this condition. When demands become too pressing, small releases are issued to cover steel for immediate needs, and it is on this hand-to-mouth buying that steel companies have been forced to live for the past six months or more. Fisher Body, for example, recently issued releases on additional material and parts for 1938 production, over and above what had been scheduled originally.

Packard has been making a few buys for 1939 model production, calling for July 25 delivery. A few other small tonnages also have been received on 1939 steel, but not in any quantity for production. Present indications are that another 30 days will pass before steel buying on 1939 models comes to a head. And it seems sure that no buyer is going to load up on steel the way some did last year under threats of steel strikes and higher prices.

Fisher releases made last week indicate assemblies will be continued until about July 24, dispelling possibility of a shut down of General Motors units at the end of this month.

July 15 is the date mentioned as marking the intermission in Ford assemblies, but according to information from the Rouge plant, no decision has been made definitely as yet regarding the end of this year's run. Mr. Ford in a statement to newspapers indicated branch assembly plants would be kept in operation while local divisions were down.

Ford Buying Cautiously

Last week Ford rehired about 1500 men in several departments such as axle, motor block, etc., where supplies of parts were running low. The additional force brought the total to about 37,500 which is still a long way from peak employment of 87,000.

Meanwhile contracts for a reported $75,000 worth of electric hoists were placed for the tool and die shop and press shop, a complete revision from original plans which called for about $400,000 worth of these hoists. This scaling down is comparable with the change made in plans for installation of presses which were trimmed from an original 300 to about 75.

The new plan does not represent a cancellation of equipment buying as much as it does a more cautious policy in proceeding with the expansion. Equipment interests are convinced Ford eventually will release contracts for the amounts originally projected, but for the present is slowing down the work, so that it may be altered from time to time as it proceeds.

According to the best information available now, all plans for the small Ford model with 106-inch wheelbase have been dropped. There is still some activity on the larger Ford, with 100-horsepower motor and 116-inch wheelbase, about 300 of these motors having been assembled for testing, although it is not known whether this job will be placed in production or not.

■ PROGRAM for the Crosley "jitterbug" seems to have struck a few snags, according to comment around Detroit, mainly on the score of trying to keep costs down somewhere near the original estimates. For example, the incident is related concerning the gas tank for the car, which was designed to hold 2½ gallons and cost sheets had indicated would run around $1. A can manufacturer then demonstrated how a saving of 60 per cent could be effected by a change in design, so this part was held up. It is a fair possibility that preliminary and experimental investigations may hold up introduction of the Crosley for several months.

New Model Programs Slow

Other new model programs likewise are moving ahead in rather hesitating fashion, subject to frequent changes and repeated starts and stops. One rather definite trend is discernible and that centers around cleaning up front ends to a greater degree by making headlamps integral with fenders, raising catwalks and smoothing up the lines of hoods and grilles. Chrysler will likely have integral lamps on all four of its lines; and there is a possibility Chevrolet will do likewise.

As far as overall appearance of bodies is concerned, as pointed out here before, there will be a marked veering toward the lines of the Lincoln Zephyr and the Cadillac 60 Special. Power plants probably will be given only minor refinements, to avoid an undue increase in costs. Weight reductions will be evident in almost every new model. Body panels will be reworked in the effort to give the driver more vision and to eliminate or minimize blind spots at corner posts.

Next year's models will see introduction of some new ideas in color as competition for buyers' eyes becomes keener. Hudson statisticians recently made a color-preference study to find out what colors were favored in various sections of the country. They found that in all but two of the 27 states east of the Mississippi river, black is the favored color, the choice running as high as 75 per cent.

West Prefers Bright Color

Contrasted with this, black is first choice in only two of the 21 states west of the Mississippi, green ranking first in 11 of these states, with tans and reds next in order. Blues and grays are about rock-and-neck for third choice in the west. Black is the leader in eight of the ten largest cities of the country, although green tops all others in Pittsburgh, with greens and tans tied in Los Angeles. Favorite colors change to some degree from year to year, black being slightly lower this year than in 1937, indicating the business outlook has little bearing on choice of car color.

The Hudson color experts profess inability to explain changes in color preferences, but they know they do exist.

Battle for control in the management of Reo Motor Car Co. flared up again last week as Donald E. Bates resigned the presidency and the board elected Col. Fred Glover to succeed him. The board voted Col. Glover complete autonomy in running the business, but Rowland Campbell, chairman, who was absent, contested the election and has called a stockholders meeting July 12 to attempt to oust the present management.

Col. Glover has been vice president and general manager of the United Specialties Co., Detroit, and is a former president of the Timken-Detroit Axle Co.

Considerable interest is being shown in a new type of resistance welding equipment designed for the automatic fabrication of automobile frames in a fraction of the time formerly required.

Dura-Products Mfg. Co., Canton, O., has taken over the sale and distribution nationally of Vitralux automotive and bicycle glass reflector products.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

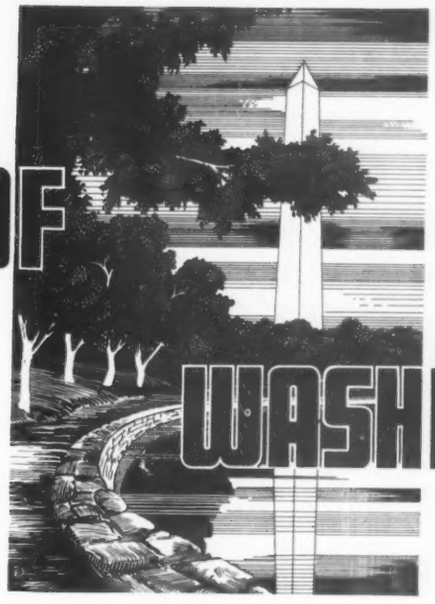
	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
April	527,625	553,231	238,133
4 mos.	1,644,622	1,855,339	907,502
May	480,518	540,377	*210,000
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Week ended	
May 28	45,120
June 4	26,980
June 11	40,175
June 18	41,790

(Production figures for the week ended June 25 will be found on page 18.)

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ THE IRON and steel and every other industry is vitally interested in how the new wage-hour bill works out.

One of the factors which undoubtedly will be of importance is functioning of the industry committees to be set up by the administrator to make wage investigations and to recommend to the administrator appropriate minimum wage rates.

According to the new act, each industry committee is to consist of an equal number of persons representing employes, employers and the public, with due regard to the geographical regions in which the industry is constituted. Under the law one of the representatives of the public will be designated as chairman. Two-thirds of the members of the committee are to constitute a quorum and decisions are to be made by the vote of the majority of all members.

Committees Canvass Wages

The industry committee, under the law, is to recommend such reasonable classifications within the industry as it determines to be necessary in order to fix for each classification the highest minimum wage rate, not in excess of 40 cents an hour, which would not substantially curtail employment or give a competitive advantage to any group. The committee also is to recommend for each classification the highest minimum wage rate, which, in its judgment, would not substantially curtail employment.

It is further set forth that an industry committee could not recommend that any classification be established nor any minimum wage rate fixed solely on a regional basis.

In arriving at proposed classifications and wage rates, the committee is to take into account, among other factors, the following: The competitive conditions as affected by transportation, living, and production costs; wages established for similar work through collective agreements negotiated between employers and employes by representatives of their own choosing; and wages paid for similar work by employers voluntarily maintaining minimum wage standards in the same industry.

GOVERNMENT SPENT MUCH FOR STEEL AND IRON

Some interesting figures have been compiled by the bureau of labor statistics of the labor department dealing with purchases by the PWA from July, 1933, to June, 1937.

It is estimated by the bureau that for this four-year period $466,000,000 of iron and steel products have been ordered for PWA jobs and of this amount $172,000,000 went for structural and reinforcing steel; $51,000,000 for cast iron pipe; $43,000,000 for heating and ventilating equipment and $200,000,000 for "other." Included in this tabulation, the bureau estimates that $292,000,000 was spent during the four-year period for machinery under which is listed $150,000,000 for foundry and machine shop products; $74,000,000 for electrical machinery and supplies and $68,000,000 for "other."

It is pointed out by the bureau that PWA orders for various building materials increased each year from 1934 to 1936. In 1934 it is stated the railroads were granted PWA loans to make repairs to their roadbeds and to extend their lines, and they placed orders accounting for 48 per cent of the value of all rails produced in that year. These orders, it is stated, tapered considerably during the next two years. In 1935 they amounted to 9 per cent of the value of the nation's purchases, and in 1936 to 6 per cent.

The bureau of labor statistics made intensive studies in five major industries, including steel, which supply the principal materials for public works and went into the accounts kept by individual companies to determine as precisely as possible the amount of labor generated all along the line.

Experts of the bureau figured that for every $1,000,000 spent for construction projects, $150,000 went for iron and steel products. This is estimated to have created 201,900 manhours of employment in mining, transporting and manufacturing.

For every $1,000,000 PWA contract for water and sewerage project, it was estimated that $520,000 was spent for materials of which $112,000 was for iron and steel products; $88,000 for cast iron pipe and fittings; and $50,000 for foundry and machine shop products.

Steel Purchases Heavy

For every $1,000,000 PWA reclamation project, it was estimated that $480,000 was spent for all materials, of which $108,000 went for iron and steel products; $58,000 for foundry and machine shop products; and $82,000 for electrical machinery, apparatus, and supplies.

It is also estimated that $465,552,000 was spent for iron and steel and their products, not including machinery, for the period from July, 1933 to June, 1937. Included in this estimate are the following: $5,256,000 for bolts, nuts, washers, etc.; $50,659,000 for cast iron pipe and fittings; $18,589,000 for doors, shutters, window sash and frames, molding, and trim (metal); $813,000 for firearms; $7,447,000 for forgings, iron and steel; $15,217,000 for

hardware, miscellaneous; $43,293,000 for heating and ventilating equipment; $2,280,000 for nails and spikes; $6,747,000 for rail fastenings, excluding spikes; $22,864,000 for rails, steel; $629,000 for springs, steel; $92,254,000 for steel-works and rolling-mill products, not elsewhere classified; $794,000 for stoves and ranges, other than electric; $172,096,000 for structural and reinforcing steel; $1,000,000 for switches, railway; $6,072,000 tools, other than machine tools; $9,273,000 for wire products, not elsewhere classified; and $10,261,000 for wrought pipe.

MONOPOLY PROBE WILL HOLD SUMMER HEARINGS

Much interest is being evidenced by representatives of business and industry in the proposed anti-monopoly investigation to be made by the special economic commission created by law during the last session.

The members of the senate and house who will represent congress on the commission include Senators King, Utah; O'Mahoney, Wyoming; Borah, Idaho on behalf of the senate, Representatives Sumners, Texas; Eicher, Iowa; and Reece, Tennessee, on behalf of the house. While the other members of the commission have not been appointed they will undoubtedly include the chairmen of the federal trade commission and the securities and exchange commission, Assistant Secretary of Commerce Patterson and a representative of the labor department. It is expected that work will begin at once on this investigation.

MANGANESE TARIFF URGED AS DEFENSE MEASURE

During the closing hours of congress, Representative Case, South Dakota, who introduced a resolution early last session to prohibit the secretary of state to include manganese in the proposed reciprocal trade agreement with the United Kingdom and Canada, told the house that "we must restore the tariff on manganese if we are to stabilize the domestic industry."

Mr. Case said that "the purchase by the government of a stock pile of a million tons of manganese ore or its equivalent in ferromanganese has been recommended. A million tons of ore would cost the United States approximately $40,000,000. The equivalent in ferromanganese would cost approximately $80,000,000.

"It is not necessary to spend that money. Restore the tariff and the purchase of limited quantities of manganese ore or ferromanganese will bring development of domestic deposits and solve the problem of manganese for national defense at little or not ultimate cost to the government.

"Revenue derived from tariffs on manganese ores imported from foreign countries could be made to offset the cost of the government of manganese for stock pile purposes while domestic production is being further developed. Restoration of the duty on manganese ore would add only 7 cents to the cost of an average ton of steel.

"Domestic producers of manganese ore are entitled to parity treatment in the matter of tariffs and prices in the domestic market the same as enjoyed by the steel industry.

"We need manganese. We have it in the United States. If we give it the slight protection contemplated in the tariff act of 1930, we will develop a domestic industry."

ARGUES TRADE AGREEMENTS DO NOT INCREASE IMPORTS

Representative Ramsay, West Virginia, made a speech just before congress adjourned in favor of the reciprocal trade agreements and took up the angle that various business interests are blaming the agreements for increased imports into the United States.

He discussed what he termed typical examples, among which he singled out the iron and steel industry.

Taking the first four months of the year he said that in 1937 imports of iron and steel were valued at $9,589,381 while during the comparable months of this year the imports were valued at only $6,208,685.

Taking the first four months of the year again, he gave the iron and steel exports of last year valued at $83,377,027 for 1937, increasing in the first four months of this year to $88,602,250.

STEEL SALES TO ENGLAND LIKELY TO BE SMALL

There are indications that United States exports of steel to England will be comparatively low in the near future.

Figures available at the department of commerce show that just prior to April 1, when the British steel import duties were raised, that the English purchased a great deal of American steel. More than a year ago, England reduced its import duties on steel and steel products. But April 1 of this year the duties which had been temporarily lowered were again invoked. Unofficial information received in Washington indicates that a good many British firms are now trying to have their government finance their large stocks of steel. It is, therefore, taken for granted that it will be some time before England is again in the market for large quantities of American steel.

ROPER SEES UPTURN NEAR IN BUSINESS SITUATION

Secretary of Commerce Roper at a press conference last week stated that "the recession seems to be scraping bottom and business must take the bat with initiative and courage."

In the fiscal year-end statement, Mr. Roper pointed to various trends and factors which he said are favorable to an early business upturn.

"The seventy-fifth congress has passed into history. The country now knows its legislative results and it also knows that no further legislation will be pending this summer," he said. "Some investigatory committees will work during the summer but responsible members of these committees have given assurance that their inquiries will be constructively conducted for fact-finding for the common good of all.

"Natural economic factors, coupled with the influence of constructive legislation enacted by a session of congress outstanding for its accomplishment, point the way to an early favorable trend in the business cycle for which business should immediately make adequate preparation.

"I do not mean by this statement to indicate that business is yet on a great unobstructed highway. Many obstacles exist, but I am saying that obstacles have been and are being removed and, with co-operation now on the part of all, a successful future will be found ahead."

ITALY'S SCRAP PURCHASES SHOW HEAVY INCREASE

United States exports to Italy have always shown a marked concentration on a few basic products, and iron and steel scrap has been added to this list during the past year, according to the department of commerce. Scrap is one of the six items mentioned by the department as constituting in all trade with Italy in 1937 over 79 per cent of total of United States exports. The rise in iron and steel scrap of course resulted from the Italian armament and self-sufficiency programs and the continued availability of supplies in the United States.

According to tabulation by the department, in 1936 the value of iron and steel scrap exported to Italy was $3,564,000 and this increased in 1937 to $6,640,000. Under the heading of machinery and vehicles United States exports to Italy in 1936 were valued at $7,483,000, while in 1937 they were valued at $6,356,000.

Let's Help Amend The Wagner Act!

■ THE WAGNER labor relations act long has been criticized by industrial leaders as a one-sided and biased instrument. Its real purpose, they have found, is to promote the exploitation of labor and employers by leaders of organized labor.

In no sense is the Wagner act a labor relations act. It contributes nothing to the creation or maintenance of labor relations. Its purpose is the unionization of employes. After this object has been accomplished the Wagner act ceases to function unless and until such time as labor leaders call for further aid.

Viewing the Wagner act in this light, there is little basis for criticizing the record of the national labor relations board. This body was created to administer a one-sided and biased act and it has proceeded effectively to do just that.

Senator Burke Heads Revision Movement in Congress

Since the Supreme Court decision which ruled this act constitutional, employers have had no choice but to engage in ineffective rearguard actions in vainly striving to defend what they regard as constitutional rights.

There can be little doubt that the Wagner act eventually will be modified to promote the harmony in labor relations which is so necessary to the future industrial progress of this country. The discord and class consciousness which it has stimulated probably belong to a mere passing phase in our history.

However, the matter is not to be viewed lightly since the struggle to change the character of the present law is likely to be a bitter one. Great political influence is wielded by labor leaders who have vested interests under the Wagner act.

Now championing a movement to revise the act is Senator Edward R. Burke of Nebraska. The senator has expressed a sound attitude on the subject of labor relations. He does not believe, as implied in the Wagner act, that employers and employes are natural enemies and that what is good for one must of necessity be bad for the other. He believes in mutuality of interest of both groups.

"I am particularly interested in knowing how your employes feel about the present situation," says the senator in a letter to manufacturers. "From many sources I gather the information that the workers are highly displeased with some of the things that have been happening and that they would welcome vital changes in the act and in the administration. The full and free right of collective bargaining should not be weakened in any way. What I propose is to make it more effective."

Need Constructive Suggestions From Employers and Employes

There is a long story of intimidation, persecution and hardship under the Wagner act and its administration. The opportunity of telling it effectively now is at hand. It is a joint story by employers and employes, for what affects one group affects the other.

The best procedure in contributing to this movement is for individual employers and employes to address their complaints and constructive suggestions to their own senators and representatives in the next congress, sending copies at the same time to Senator Burke.

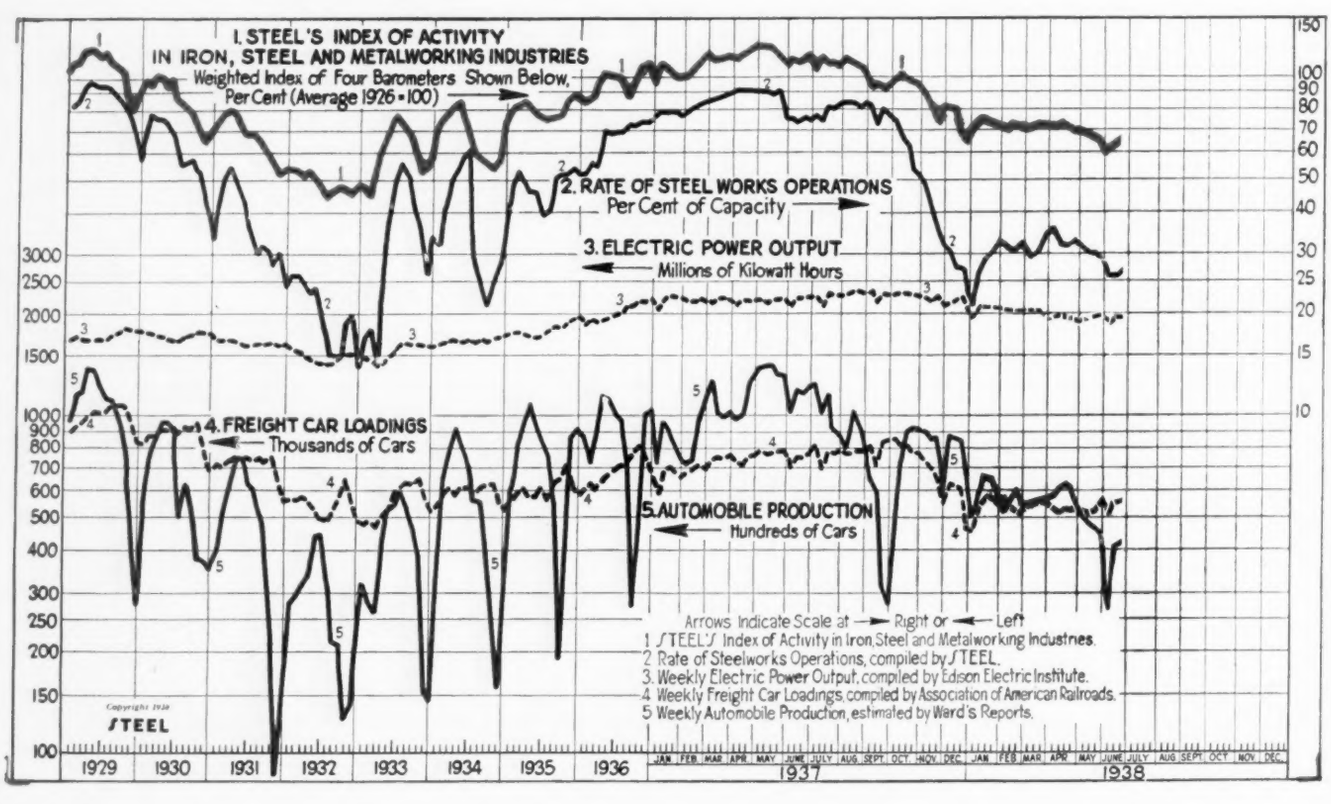
THE BUSINESS T

Rate of Industrial Activity Continues To Improve

■ FOR the second consecutive seven-day period since Memorial day week STEEL's index of activity in the iron, steel and metalworking industries showed a moderate gain. The latest advance almost restored the index to pre-holiday levels. It now stands at 65.3 per cent compared with 64.4 in the preceding week and 66.5 in the week ended May 28.

Contributing to the recent advance in the activity index for the week ended June 18 were moderate increases in three of the four barometers from which the index is composed. The most encouraging of these was a gain of 1.5 points in the rate of steelmaking operations, thereby regaining part of the loss incurred during the week ended June 4. Still further improvement in this barometer is indicated for the week ended June 25.

Automobile assemblies increased approximately 1500 cars to 41,790 in the week ended June 18. This represents the second consecutive weekly advance, although

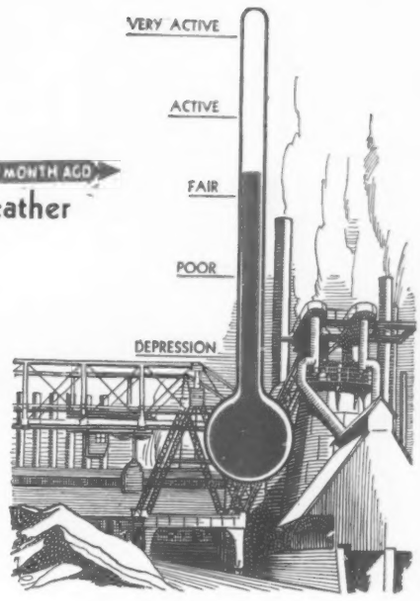

1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity gained 0.9 points to 65.3 per cent in the week ended June 18:

Week ending	STEEL's Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4	114.0	35.0	90.0	1,975	2,200	572,952	761,109	56,800	101,046
Apr. 2	72.0	112.0	36.0	91.5	1,978	2,146	523,489	726,687	57,500	97,005
Apr. 9	71.3	112.8	32.0	91.5	1,990	2,176	521,978	716,044	60,975	99,196
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767	761,182	60,563	133,164
Apr. 30	68.4	123.9	32.0	91.0	1,938	2,193	543,075	782,423	50,755	139,475
May 7	68.5	123.5	31.0	91.0	1,939	2,176	536,140	767,481	53,385	140,188
May 14	67.2	123.2	30.0	89.0	1,967	2,194	541,813	773,669	47,415	140,396
May 21	67.1	122.2	30.0	91.5	1,967	2,198	545,808	779,276	46,810	131,306
May 28	66.5	115.6	28.5	75.0	1,973	2,206	562,061	794,855	45,120	131,421
June 4	58.1	105.1	25.5	75.0	1,878	2,131	502,624	692,140	26,980	101,629
June 11	64.4	111.4	25.5	74.0	1,991	2,214	553,854†	754,360	40,175	178,798
June 18	65.3*	110.3	27.0	75.5	1,991	2,213	560,500*	756,299	41,790	111,620

*Preliminary. †Revised.

STREND



Industrial Weather

TREND:

Unchanged

it fell short of restoring all the ground lost during Memorial day week. The outlook for this industry over the next 60 days is highly uncertain. Indications now are that assembly lines will continue at the present level through the remainder of the month, gradually easing to lower schedules during July with a sharper downward tendency through August.

Revenue freight carloadings registered a moderate increase to approximately 560,500 cars in the week ended June 18. Despite the fact this represents the second consecutive weekly advance it failed to completely restore the loss incurred in the week ended June 4. Electric power output was the only industrial indicator composing STEEL's index to lose ground during the week ended June 18. However, the loss was negligible and excluding the preceding week represents the highest weekly power consumption since March 26.

Business sentiment seems improved somewhat on the basis of moderate gains in a number of industrial indicators since Memorial day week. There appears to be the beginning of a reversal in the defeatist psychology of the nation's thinking. Beneficial effect of such an adjustment in mental attitude should be reflected in an upward tendency of a number of business indices in the near future.

Where Business Stands

Monthly Averages, 1937 = 100

	May., 1938	Apr., 1938	May, 1937
Steel Ingot Output	45.2	46.4	124.2
Pig Iron Output	40.4	45.9	113.6
Freight Movement	74.9	73.2	107.4
Building Construction	92.9	87.1	107.7
Automobile Production	...	56.9	129.2
Wholesale Prices	90.4	91.2	101.2

The Barometer of Business

Industrial Indicators

	May, 1938	April, 1938	May, 1937
Pig iron output (daily average, tons)	40,675	46,267	114,328
Machine tool index	88.0	91.0	234.2
Finished steel shipments	465,081	501,972	1,304,039
Ingot output (daily average, tons)	72,272	74,045	198,213
Dodge building awards in 37 states (sq. ft.)	34,760,000	32,569,000	40,287,900
Automobile output	.....	238,133	540,357
Coal output (tons)	21,995,000	22,380,000	29,980,000
Business failures; number	1,053	1,116	834
Business failures; liabilities	$14,559,000	$20,106,000	$8,364,000
Cement production (bbls.)	.....	7,983,000	11,634,000
Cotton consumption (bales)	426,000	414,000	669,000
Car loadings (weekly av.)	543,956	531,604	779,541

Financial Indicators

	May, 1938	April, 1938	May, 1937
25 Industrial stocks	$143.10	$141.29	$210.16
25 Rail stocks	$16.97	$16.44	$46.12
40 Bonds	$67.99	$65.45	$85.35
Bank clear'gs (000 omitted)	.....	$21,667,000	$23,951,000
Commercial paper rate, New York (per cent)	1	1	1
*Commercial loans (000 omitted)	$8,334,000	$8,587,000	$9,529,000
Federal Reserve ratio (per cent)	82.4	82.6	79.7
Railroad earnings	†$9,236,818	$14,470,444	$47,807,447
Stock sales, New York stock exchange	14,007,564	17,119,534	18,564,979
Bond sales (par value)	$121,323,925	$138,457,350	$178,891,200

*Leading member banks Federal Reserve System.
†April, March and April, respectively.

Foreign Trade

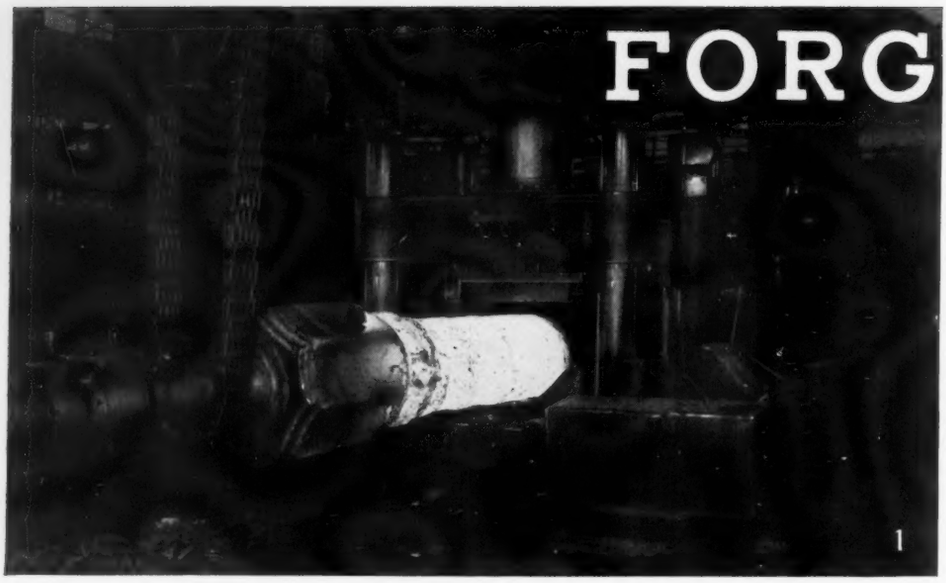
	May, 1938	April, 1938	May, 1937
Exports	.....	$274,482,000	$289,922,000
Imports	.....	$159,907,000	$284,901,000
Gold exports	.....	$13,000	$4,000
Gold imports	.....	$215,825,000	$155,366,000

Commodity Prices

	May, 1938	April, 1938	May, 1937
STEEL'S composite average of 25 iron and steel prices	$38.50	$38.61	$40.06
U. S. Bureau of Labor index	*78.0	78.7	87.4
Wheat, cash (bushel)	$0.93	$0.98	$1.47
Corn, cash (bushel)	$0.71	$0.73	$1.47

*Estimated.

FORGINGS on the



Forging 48-inch ingot in 3000-ton steam hydraulic press. Hot ingot, weighing 40 tons, is rotated by the turning rig and moved with balancing mandrel by manipulating it with the crane

By R. L. HOMSHER

Allis-Chalmers Mfg. Co.
Milwaukee

■ THE COLORADO RIVER aqueduct from the Parker dam to the Cajalco reservoir is a project to supply southern California with sufficient water. Its total length is 241.7 miles, stretching across desert waste, through mountains and isolated valleys. It is made up of 92.1 miles of tunnel, 54.4 miles of cut and cover conduit, 62.8 miles of open line canal, 28.7 miles of inverted syphons, 1.2 miles of pumping delivery lines, 1.1 miles of open ditch into the Cajalco reservoir and 1.3 miles of passes through storage reservoirs.

In the first 126 miles from the Colorado river it is necessary to lift the water a total distance of 1617 feet. This is accomplished by five pumping stations with an initial installation of three pumps each.

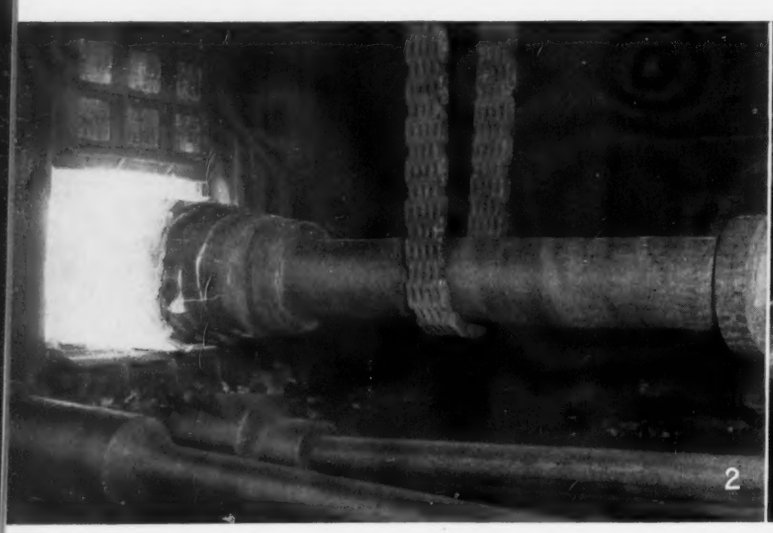
Allis-Chalmers Mfg. Co., Milwaukee, built the pumps and motors complete for the Iron Mountain station and in addition fabricated shafts for the Eagle and Hayfield stations for another pump manufacturer. While all these pump forgings were manufactured in our forge shop, this article relates to those supplied to the outside pump builder through the Engine and Condenser department. Accompanying illustrations show all the steps in the forging of these shafts.

Sections of these shafts range in length from 6 to 22 feet and are 22 and 24 inches in diameter with a 6-inch bore running their entire length. They are fastened together by means of 36-inch diameter integral forged flanges and ten 2¾-inch diameter stud bolts.

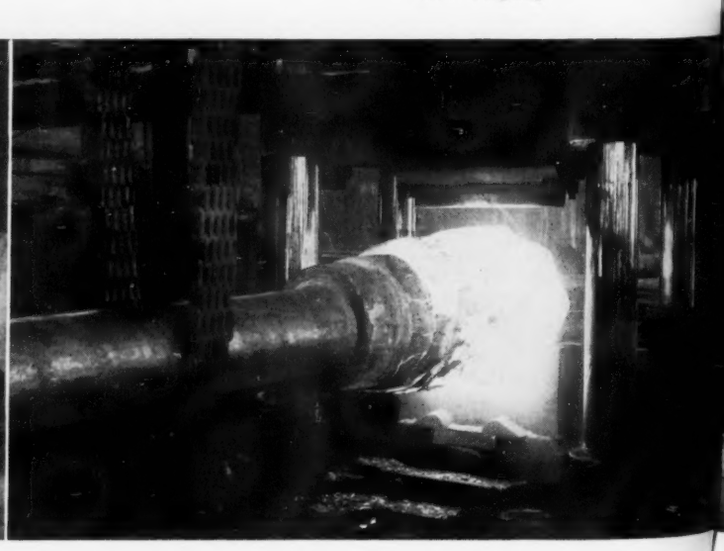
Two 48-inch ingots weighing 100,000 pounds each and six 48-inch ingots weighing 80,000 pounds each were required to make these shafts. Material specified was A.S.T.M. A-18-30, Class E, with the following chemical analysis: Carbon 0.40 to 0.45; manganese 0.40 to 0.80; phosphorus maximum 0.05; sulphur maximum 0.05.

The ingots were top poured with hot tops. After casting they were normalized in the steel company's

Removing 48-inch ingot, at 2250 degrees Fahr., from the furnace. Two intermediate shafts are worked as one integral forging



Heated 48-inch ingot is placed in press for final forging operation. Steel link belt facilitates handling and forging



FOR PUMPS

Colorado River Aqueduct

Shafts for these huge pumps were made in four sections connected by integral, forged, male and female flanged couplings. Precise machining produced assemblies out of line less than 0.0015-inch in 41 feet. All steps from hot ingot to assembled shaft are illustrated in detail

neutralizing pits before allowed to cool for shipment to the West Allis works. After receipt of the ingots at West Allis, chemical analysis was checked by taking drillings from the ingots and these were analyzed in our chemical laboratory and approved by an inspector. When we were satisfied that the steel was of the proper chemical analysis, work on the forging was begun.

The first operation was preheating of the ingots to approximately 800 degrees Fahr. in a preheating furnace, which required from 50 to 60 hours. The ingots then were moved to the forging heating furnace and heated to approximately 2250 degrees Fahr. for the forging operation. This heating required about 48 to 54 hours for a thorough and even heat, which is very important.

After heating had been properly carried out, the hot ingots were worked into the desired shape under the 3000-ton press. The shaft sections were forged in multiples, that is, two impeller shafts were forged as one integral forging, two lower intermediate shafts were forged as one integral forging, etc.

Flanges Integral

Due consideration was given to the reduction of area from the original ingot to the finished forging in order that the desired physical properties could be obtained. After the forging was completed, the shaft was cooled in the furnace free from drafts and then heat treated.

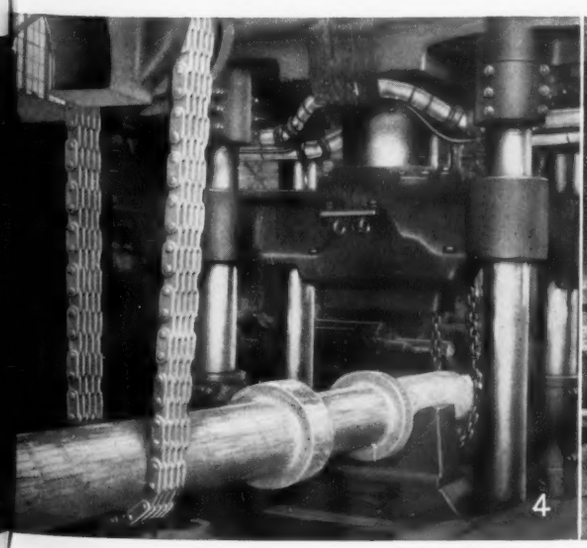
The heat treatment consisted of one anneal. It required about 24 hours to bring the shaft up to the proper temperature at which it was held for a period of about 20 hours. Heat treating furnaces are equipped with modern temperature control in order that the heat treating temperature can be controlled properly.

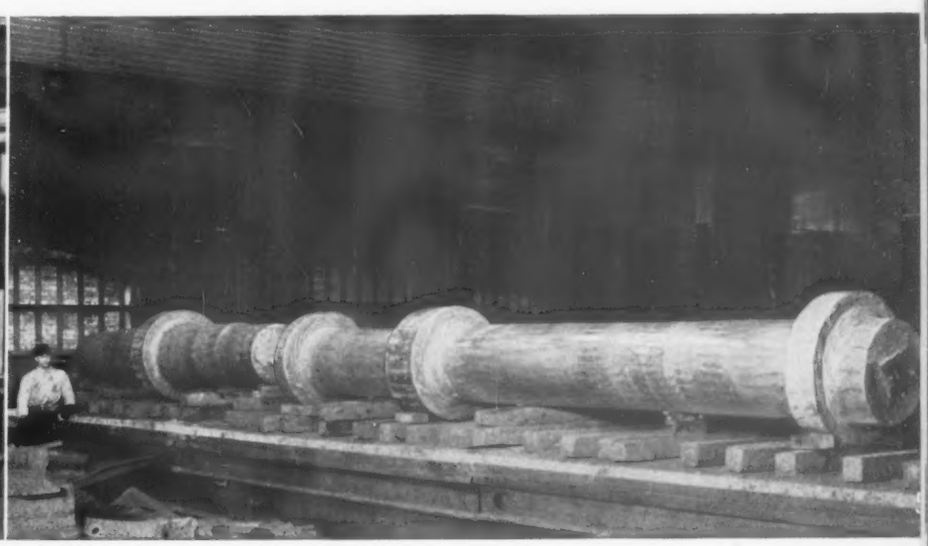
After annealing, standard navy 0.505-inch diameter longitudinal tensile test bars were taken from these forgings. Before machining was started on any piece physical tests were obtained from each of the forgings. The physical results required were: Tensile strength 75,000 pounds per square inch; yield point 37,500 pounds per square inch; elongation in 2 inches 18 per cent; reduction of area 29 per cent.

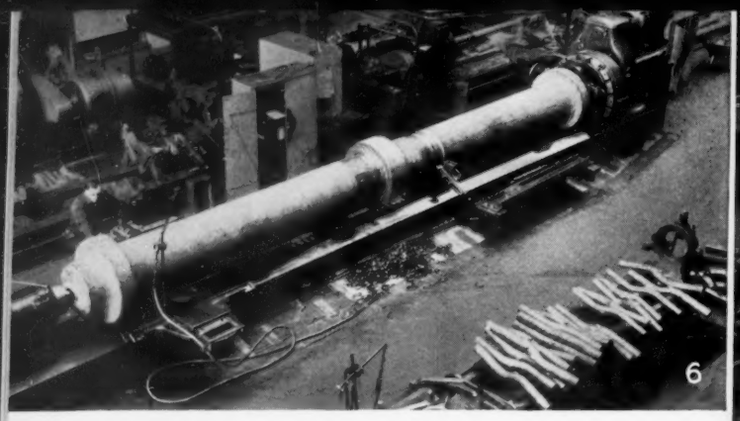
In the machine shop the shafts

Completed multiple intermediate shaft forging in press prior to cutting off crop end of ingot. Flanges are forged as an integral part of the shaft

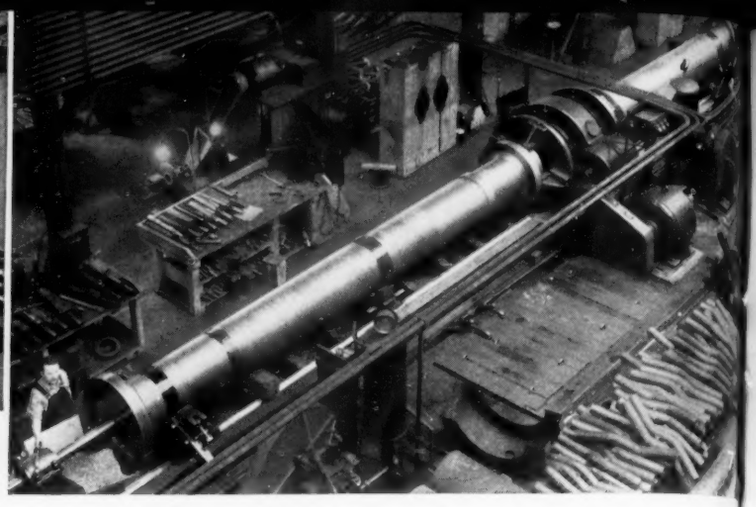
Multiple shaft forgings of impeller shafts and intermediate shafts on truck ready to enter car type annealing furnace for heat treatment







Large roughing lathe machining multiple intermediate shaft which at this stage is 24 inches in diameter, 27½ feet long with 36-inch diameter flanges



Gun boring lathe cutting 6-inch hole in 22-inch diameter intermediate shafts. Upper section is about 21 feet long and lower is near 13½ feet

first were lined up, then centered, rough machined and cut to length. They were drilled, bored and reamed for inspection. After boring and reaming, the inner surfaces of the shafts were inspected with a periscope for pipes, gas pockets, blow holes or any other defects which may have been in the original ingot and for any injury caused by forging. After the inspectors were satisfied that the forgings were free from any defects, the shafts were finish machined and then polished.

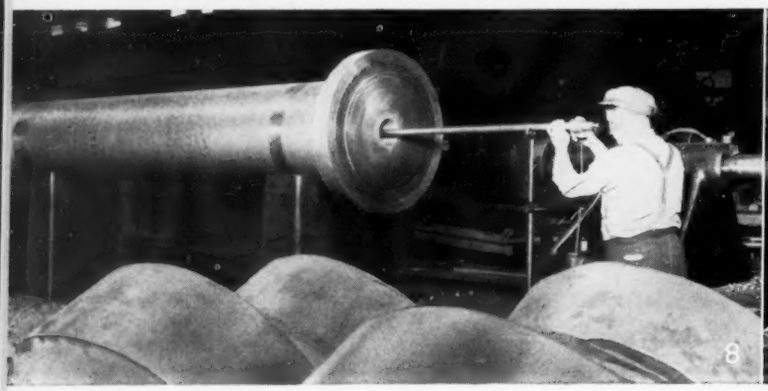
Each section was accurately machined and polished throughout and given very close shop inspection. No tool marks or deep scratches were allowed to remain on any part of the shaft; all changes of cross section were designed to be gradual, and all fillets were liberal and well polished in order to avoid any concentration of stresses.

Made in Four Sections

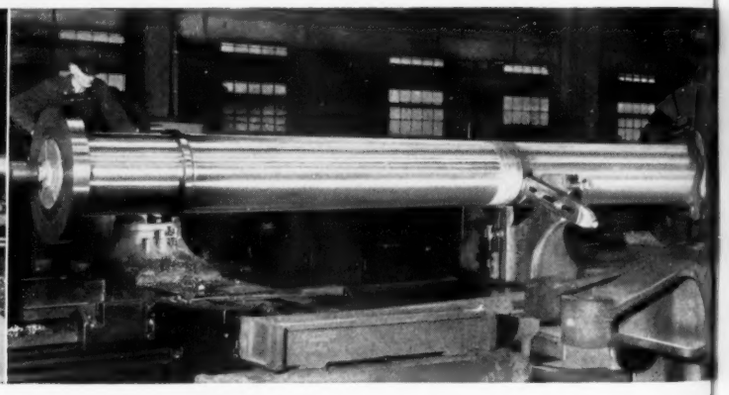
Each of these shafts was made in four sections consisting of impeller shaft, upper intermediate shaft, lower intermediate shaft and motor shaft, the latter being supplied by the motor manufacturer. All sections are connected by male and female flanged couplings forged as integral parts of each section.

The flanged couplings were drilled

(*Please turn to Page* 50)



Inspecting lower intermediate shaft with periscope for defects such as pipes, gas pockets, blow holes, one of several tests



Here final cuts are made on a large section of upper intermediate shaft. Precision lathe produces highly finished surface

•

Special setup used in the machine shop for reaming flanged coupling bolt holes simultaneously to secure accurate alignment

•

Indicating for alignment in 65-foot lathe. In total length of three sections, about 41 feet, assembly was out less than 0.0015-inch

Gas Immersion Heating

Submerged heaters with thin walls promote speed in heat transfer, eliminate heavy furnace structure and minimize radiation losses

By J. B. NEALEY
American Gas Association
New York

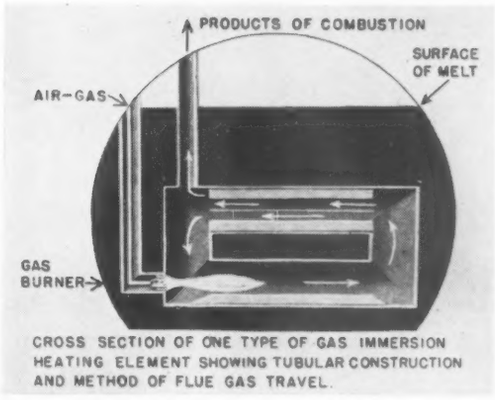
■ GAS IMMERSION is one of the newer methods employed to melt soft metals. Heat is developed in the bath itself. Radiation losses through furnace walls and refractories absorption are minimized as no furnace exists. The method is not confined to metal melting for it also is being used in heat treating where it is applied successfully to heavy materials such as salts. Liquids such as pickling, cleaning and plating solutions may also be heated efficiently by this method. Gas immersion is finding wide application in heat treating operations as well as tinning and other coating processes.

Immersed in Bath

In gas immersion heating and melting, alloy metal tubes carrying the combusting gas are immersed in the bath. Sometimes one end of the tube is welded to a hole in the pot or tank and a gas burner clamped outside the tank so as to fire through this hole and into the tube or coil. An upright piece of pipe at the other end of the coil acts as a flue.

When it is not advisable to cut holes in the pot, a U-tube can be used with the gas burner firing down one leg. Another type of gas immersion unit uses a heating element fabricated from nickel chromium tubing welded in the form of a rectangle. A single burner head, located in the element itself, fires an air-gas mixture, under pressure, into the horizontal cross-over. This high velocity flame entrains products of combustion from the upper crossover, setting up a circulation which produces a uniform temperature throughout the entire unit. An air gas pipe and a vent complete the unit.

Coils, U-tubes or rectangular elements can be made in any size or



CROSS SECTION OF ONE TYPE OF GAS IMMERSION HEATING ELEMENT SHOWING TUBULAR CONSTRUCTION AND METHOD OF FLUE GAS TRAVEL.

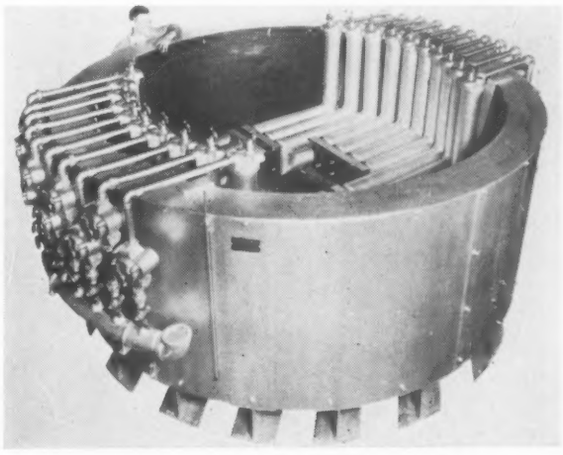
Cross section of one type of gas immersion heating element showing tubular construction and path of flue gas travel

employed in multiple according to the extent, speed, and duty of the operation. In fact the thermal efficiency of an installation can be accurately estimated at the time it is designed and prior to fabrication.

With gas immersion heating, the bath is always hotter than the pot which helps to minimize radiation losses. As the pot or tank is set in a bed of insulating material structural strength for suspension is no longer necessary. This means the pot can be made of much thinner material which effects a dual saving in first cost and lower fuel consumption required to heat the pot. Furthermore, the walls of the gas immersion heater are made of thin material which permits rapid heat transfer and high thermal efficiency.

This new heating method is suitable for much heat treating work. Considerable hardening and annealing is done in lead and cyanide pots while much annealing and drawing is accomplished in salt baths. On these applications large furnace structures are eliminated, pot walls reduced in thickness, insulation is more effective, heat up periods are reduced to minimum and pot life is increased. Also dross formation is materially reduced.

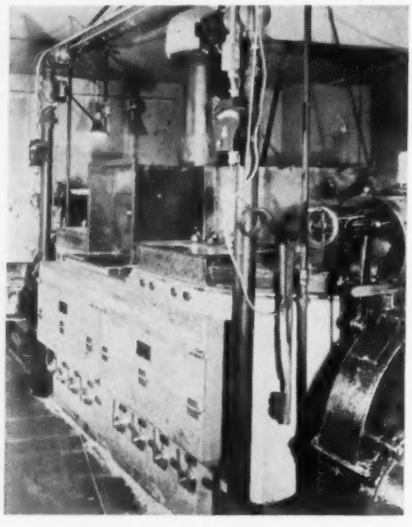
Perhaps the best way to illustrate



Gas immersion heaters melt 30 tons of lead per hour with a total capacity of 60 tons of metal in this unit recently built for Goodyear Tire & Rubber Co. Connected load of 3800 cubic feet of 1050 B.t.u. gas per hour

what can be done with a lead hardening pot is to cite the experience of the printing industry where efficient soft metal melting has been widely used for a number of years in type metal melting for linotype and monotype machines and for pigging, lead melting for backing electros, melting of newspaper stereotype metal, etc. Here insulation, automatic temperature control and gas immersion heating have been effectively combined to promote speed and economy of operation.

High speed of casting is a vital necessity to this industry as pots are operated at maximum capacity



Said to be world's largest stereotype melting pot, this unit furnishes 38,000 pounds of molten metal per hour and is heated by gas immersion units

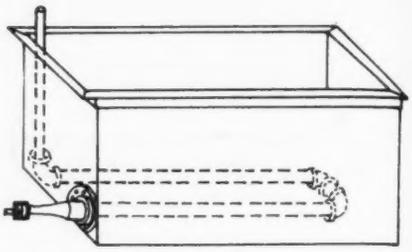
during busy periods. An example of savings made possible by gas immersion heating was seen at the *Chicago Daily Times* which recently changed its stereotype pot over to this new method with a saving of approximately 60 per cent in fuel bills. Because of the greater heat input with gas the metal is efficiently melted at 585 degrees Fahr., as contrasted with a temperature of 615 degrees Fahr., previously required to maintain production. A better plate also results because the metal is cast at this lower temperature.

Two stereotype machines here cast 75-pound plates at the rate of 4 a minute each and while this is an intermittent operation it is possible with both machines operating to cast 480 plates, 36,000 pounds, from one pot, every hour.

As lead melting is a factor in the rubber industry, Goodyear Tire & Rubber Co., Akron, O., recently installed a 60-ton pot with 20 gas immersion heating elements. While the connected load is 3800 cubic feet of 1050-B.t.u. gas per hour the actual hourly gas consumption, with an output of 30 tons per hour at 750 degrees Fahr., will be less. The connected load was purposely made large to allow for spasmodic casting periods when momentarily the actual output would exceed the 30 tons specified.

Facilitates Tinning

Tinning is a finish widely applied to sheet steel. Here a double compartment pot is employed, one compartment for palm oil and the other for molten tin. The movement of sheet steel through these compartments is controlled by motor driven rolls and the tin is efficiently melted with gas immersion heaters. A pot of this type with immersion heating uses only 23 cubic feet of gas per box of product as compared to 42 cubic feet with the old type. Temperature fluctuation also has been cut from 15 to 2½ degrees Fahr. accompanied by a saving of 45 per cent in fuel. Dross produced per hour was cut from 1.85 pounds to 0.47 pounds, a reduction of 75 per cent. At the same time, production was stepped up by almost



A simple form of gas immersion heater installation with pipe coil inside and gas burner outside the tank

15.5 per cent or from 260 to 300 boxes per eight hour shift.

Gas immersion has been found suited to the automotive storage battery industry where it is used in casting storage battery grids of special lead antimony alloys.

Pots and kettles with gas immersion heating may be easily and effectively insulated against heat losses. As a large portion of soft metal melting is intermittent with relatively long idle periods, heat stored in a setting and pot may be dissipated during standby so good insulation is a decided advantage.

Use Lead Coils

Regarding the use of gas immersion heating applied to acid solutions, there are few metals that will not succumb to strong acids but lead and even cast iron have proved successful in the weaker solutions. Lead coils for heating pickling solutions of sulphuric acid are recommended and can be used with either wood or metal tanks. Ordinary waste pipe of 4-inch diameter and with wall thickness of ⅛-inch is effective on such installations.

Lead melts at about 622 degrees Fahr., but as the portion of the pipe that is in contact with the high temperature gas flame, in excess of 2000 degrees Fahr., is submerged in the bath, and since there is an intimate contact between the liquid and the outside surface of the pipe, heat is absorbed by the liquid so rapidly

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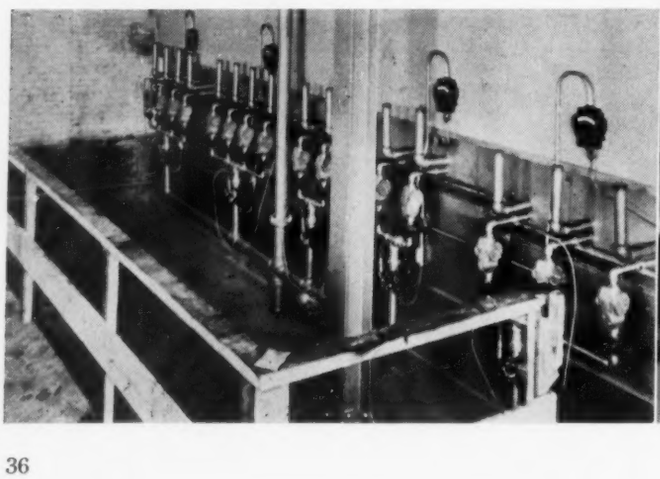
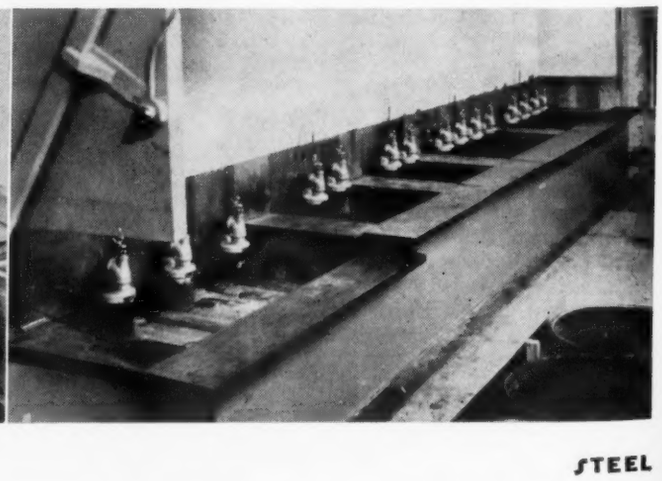
Gas immersion heaters in pots at right provide the fast melting vital for high production in tinning large milk cans with a heavy coat of tin. Automatic temperature controls and indicating pyrometers at left are mounted on opposite side of partition





Electroplaters Turn to Research For Solution of Shop Problems

■ TWO TECHNICAL sessions dealing with theoretical and practical aspects of metal cleaning, plating and coloring, and two business sessions, brought to a close the twenty-sixth annual convention of the American Electro-Platers' society at Hotel Schroeder, Milwaukee, June 13-16. Summaries of early sessions were presented in the June 20 issue of STEEL, a resume of the final sessions is given herewith.

As announced last week, William Phillips, research engineering department, General Motors Corp., Detroit, was elected president of the society to succeed A. B. Wilson, metallurgist, Chevrolet division, General Motors Corp., Detroit. It was stated also that the 1939 annual convention will be held in Asbury Park, N. J., sometime in June, and jointly with the International Electro Depositors' Technical society, London, England.

Several reports presented at technical sessions concerned scientific details and technique of electrodeposition processes, although adequate attention was directed to practical operating problems, such as the probable causes of difficulties and the treatment to correct them. A number of the investigations reported upon were conducted by various branches of the society as co-operative group activities.

One of the latter, sponsored by the Hartford, Conn., branch, was concerned with dips and their uses in the plating industry, particular attention being paid to problems arising between the degreasing bath and the plating tank. Dipping operations may become too complicated, it was stated. One plant, for example, employing 24 dips, was able to reduce this to four, with better results and considerable economy. In most cases, each metal and finish requires special dips and treatment.

Improving Dip Practice

Important considerations in use of dips include keeping the dip free from contamination, removing the chemical film formed, and maintaining proper strength. Recommendation was made that the final dip be made in a solution similar to the plating bath to avoid dilution of the latter and to decrease drag-in of undesirable elements.

Modern metal coloring is a rediscovery of methods used by the ancient Egyptians and alchemists in their search for a means to make common metals look like gold, asserted George Hogaboom, engineer, Hanson-Van Winkle-Munning Co., Matawan, N. J., in a paper on metal coloring. Egyptian and modern formulas for gold coloring are almost identical, he said.

One of the chief commercial difficulties in coloring metals is the lack of standard nomenclature for colors as applied to metal finishes. As a result, it is necessary to use samples to visualize them. Mr. Hogaboom displayed 224 samples of colored metal finishes commercially available. The range, he stated, is limited only by skill of the worker. A thorough knowledge of the metallurgical and physical characteristics of a metal to be colored is most helpful to the finisher. In conclusion, the speaker said dry coloring usually provides a better opportunity for obtaining the particular color desired.

Reducing Drag-out Losses

Drag-out losses, which increase with solution viscosity and concentration of carbonate and sulphate in cyanide planting solutions, can be reduced by lowering the concentration, according to R. O. Hull, research engineer, Grasselli Chemicals department, E. I. du Pont de Nemours & Co., Cleveland. He recommends reducing the sodium carbonate concentration by addition of sodium sulphate and removing the excess sulphate by crystallization with ice. Reduction of drag-out losses effected in this way has shown considerable savings, he declared.

Although manufacturers frequently express the wish that they could avoid plating, electrodeposition nevertheless has become an important aid to the manufacturer by simplifying reproduction of complicated work, asserted J. H. Hoefer, chemist, A. T. Wagner Co., Detroit. This paper was presented on behalf of the Detroit branch of the society. The speaker mentioned automobile radiators, cooking utensils of two metals, caskets, gaskets, screens and duplicate patterns, as some of the articles economically made entirely or almost entirely by electrodeposition. Sheet copper is made electrolytically. Building up by chromium plating has provided the "dimension stretcher" and "hole reducer" so often desired by the machinist, he stated.

Dripping grease or oil from automatic plating equipment often is responsible for contamination affecting the action of wetting agents in plating solutions, according to a report on wetting agents prepared by the Newark, N. J., branch. Since contamination of wetting agents affects the ductility of plated coatings, even before contamination is sufficient to produce obvious defects in the coating, frequent tests should be made of surface tension of the solution and of ductility of the coating. The report described the equipment for making these tests.

Presenting a paper on industrial finish manufacture, E. Bucy, technical director, Zapon division, Atlas Powder Co., Stamford, Conn., stated that extensive use has been made of the urea formaldahyde base lacquers because of the stability of color, the relatively short baking time, durability, resistance to ordinary service conditions, and feasibility of using special modifiers for special surfaces or purposes. Surface of the metal must be clean and curing is by molecular rearrangement rather than oxidation or drying.

Cleaning by use of solvent emulsions removes dirts ordinarily not otherwise easily removable because the method provides vigorous agitation and shower or spray rinsing. Prevention of drag-over into the plating bath is another advantage. Contributing a paper on the subject of cleaning by solvent emulsions, Dr. Mitchell, technical director, Magnus Chemical Co., Garwood, N. J., listed limitations as follows: Work must be comparatively dry, the shower rinse requires a large volume of water, work must be dried if it is to be lacquered, and the process is not well suited to hollow work because of the difficulty in rinsing and draining. He gave advantages as: Economy, speed, and thoroughness of cleaning without scrubbing.

Fumes in Plating Room

Exhausting of fumes in a plating department is an air conditioning problem, stated H. A. Smith, chemist, Coulter Copper & Brass Co., Toronto, Ont., in reporting on an investigation sponsored by the Toronto branch. Exhausted air must be replaced, he said. Uncontrolled introduction and directioning of incoming air may impair the effectiveness of fume removal equipment, for example, an open window near a plating tank may distribute fumes irrecoverably throughout the room. Mr. Smith recommended block glass for windows and skylights, maintenance of air in the plating room under slight pressure, filtering and heating or cooling of the air, and distribution of the air so as to carry fumes away from the workers.

The speaker expressed a preference for rectangular ducts because they are more easily streamlined, can be made longer and require less power. Light-gage metal ducts cost

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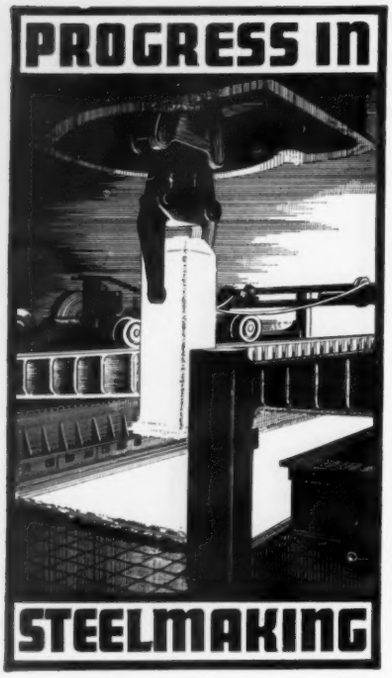

Mass Charging

Improved furnace construction with new system of placing entire charge on hearth at one time increases furnace output and decreases production costs

■ A NOVEL process and apparatus for charging open hearth furnaces is the subject of three patents issued recently to Wellman Engineering Co., Cleveland.

This new process departs from the "spoonful" method of charging and employs an entirely different method for conveying and depositing in furnaces the cold metal charge in large bulk. It is comparable with methods and machinery now used for handling practically all other products in steel works since it permits a large part, and preferably the entire cold metal charge required for a heat, to be deposited in the furnace at one time. Thus it affords a more economical method as to power and fuel consumed, speed of operation, and maintenance cost of the charging equipment as well as the furnace itself.

These objectives are secured by constructing the open hearth furnace with a removable front which is substantially as long as the hearth and which can readily be extracted and replaced to permit insertion of a charging pan or receptacle. This charging pan has a floor area similar in size to that of the furnace hearth. This makes it possible to cover the entire hearth with cold metal or other material in one charging operation. At the same time, the furnace front is provided with hot metal and inspection doors arranged to function in the usual manner.

Front Removable

New features of this system include provision of a removable furnace front comparable in length with the furnace hearth, provision thereon of individually movable doors similar to those in use on the nonmovable or permanent hearth furnace front, extracting and lifting mechanisms for the furnace front, and operating devices for the various doors, each capable of functioning without interference with the other.

Charging equipment consists of a charging machine proper constituting one unit, and a suitable receptacle or pan having a flexible rolling bottom with a floor area substantially equal to the entire hearth area to be charged. This pan is leaded with the cold metal charge at any suitable point and brought up to and deposited on the cradle of the charging machine which then is moved down the track till it is opposite the furnace to be charged. After the charging operation has been completed, the

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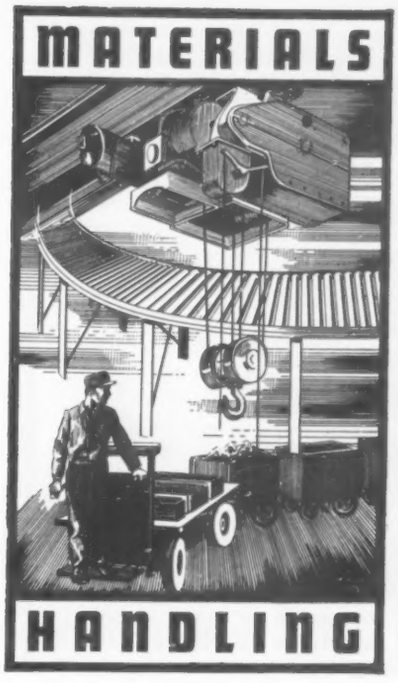
Four stages in charging furnace by new system: First, material ready to charge; second, door opened and charge inserted; third, charge being deposited as machine retracts; fourth, charge inserted



All on One Floor

Continued expansion results in building new plant containing 200,000 square feet on one floor. Handling system features continuous floor-level conveyor

■ DURING the latter part of May, Circle Wire & Cable Corp., Brooklyn, N. Y., began moving from its former quarters at 24 Woodward avenue into a new plant, construction of which had just been completed at 5500 Maspeth avenue. Designed to provide modern facilities for continuous straightline production of armored cables, flexible steel conduit and other related products, this new plant is an outstanding example of the modern trend towards building around the materials handling system.

Area in Demand

In 1920, when the business was organized, space occupied was approximately 2000 square feet and only steel armored cable was manufactured. As business expanded, additional facilities demanded more area and during each of five years from 1931 to 1935, inclusive, new building units were added. While all possible was done to utilize this space to the best advantage, it became evident that each additional unit made the manufacturing and handling problems more involved. When, therefore, it became necessary to erect an additional unit on a vacant lot adjoining the older structures, or to construct an entirely new plant in a new location, the latter plan seemed more logical.

Erected on a site containing approximately 10 acres, purchased from the Long Island Railroad Co. and adjoining that road's main line, the new building contains close to 200,000 square feet of floor space on a single floor. It is 600 feet long from north to south, with its westerly wall curved slightly inward to accommodate a long switch-track from the railroad right of way. This track does not run the entire length of the building, stopping just short of recessed loading docks so incoming and outgoing motor trucks may be serviced without interference with freight loading and unloading operations. Siding capacity is twenty standard box cars.

Receiving incoming steel, copper and other raw materials takes place on the westerly side of the building just inside the wall adjoining the railroad tracks. Doors located at convenient intervals down the length of the west wall give ready access to incoming freight. Cars are spotted according to materials being received. For example, all rubber is unloaded at the southwest corner of the plant so it is immediately adjacent to the first batching operation. Steel is unloaded at a similarly convenient point for first handling. Some 50,000 pounds of steel a day are used in manufacturing but one item of one size of armored cable.

Beyond the end of the switch-tracks, near the front of the building, is located the shipping depart-

It Stacks Them to the Roof

■ Storage space was tripled by stacking these nail kegs without increasing floor space. Photo courtesy Baker-Raulang Co., Cleveland

ment, which has access to both motor truck recesses and the end portion of the freight tracks.

Built in at floor level and making a continuous circuit of the entire floor is a chain-driven steel apron conveyor, serving as a transporting medium for reels, both empty and filled, and for coils of materials from operation to operation and through to storage and shipping departments. This main conveyor is really the heart of the plant handling system, and is continuously at floor level except for a short distance near the front of the building where, in order to provide clearance for a storage room, it passes down through a tunnel to emerge once more at its normal level just beyond the storage area.

Consecutively Laid Out

Production departments are laid out consecutively, beginning with the rubber department and following through braiding, saturating, coiling and other operations in their proper order of sequence. This eliminates back-tracking and provides a smooth flow in a practical straightline path from receipt of raw materials to shipment of finished product.

In addition to the long floor-encircling conveyor, one of the most interesting materials-handling equipment items is the batch handling system in the rubber department. This consists of a truck-mounted batching scale, a battery of five large hoppers extending from floor almost to ceiling, and a series of conveyors, including a power driven vertical elevating unit, a gravity roller line and a spiral chute. The entire operation is largely automatic.

The scale truck moves on a narrow gage track beneath the battery of hoppers and is pushed by the operator from one to another, receiving from each hopper the required amount of the different ingredients for the batch. It then is moved along the track a few feet beyond the last hopper station and placed in a vertical elevator which automatically carries it up to required height and deposits it on a roller conveyor. From here it moves to position for automatic dumping into one or the other of two huge mixers. After the truck load is dumped, it moves down a gravity spiral chute under its own power to its original station near the hoppers.

Overhead handling throughout the plant is largely by air and electric hoists. In the rubber department, air hoists predominate. Elsewhere there are a few places where electric hoists serve as utility units. Just beyond the final production area is located the inspection department. Here are located four testing tanks wherein wire and cable are submerged for governmental speci-

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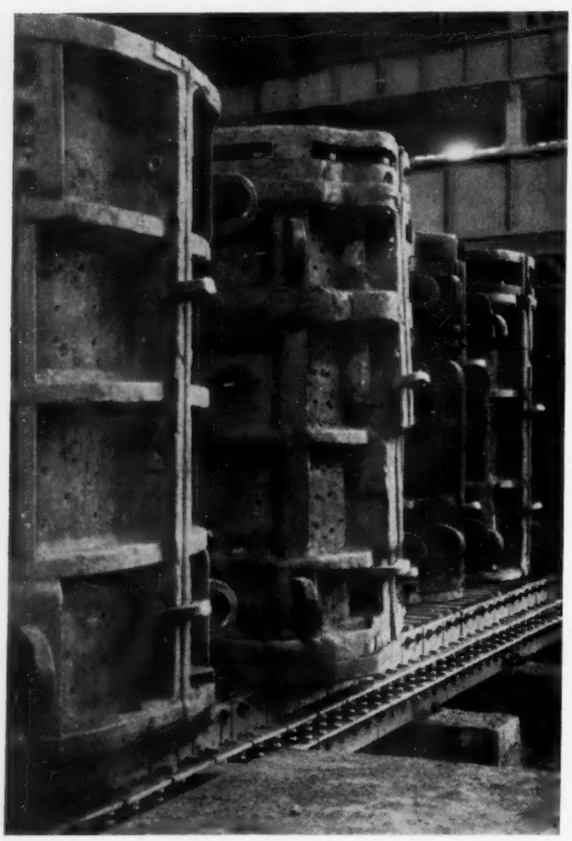
Conveyor Rolls Are Spring Mounted



■ Springs help conveyor to withstand shock when crane sets down heavy empty molds. Photo courtesy Mathews Conveyer Co., Ellwood City, Pa.

Builders' Handbook In Seventh Edition

■ *Spon's Practical Builders' Pocketbook*, 1938, seventh edition; 572 pages; supplied by STEEL, Cleveland, for $3.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A reference work of memoranda, tables and official rules and regulations for architects and builders.

The arrangement of the matter in alphabetical sequence has been adhered to, making it easy to turn up any desired formula or memorandum. Each of the building trades is dealt with individually and information on special subjects is given under separate headings.

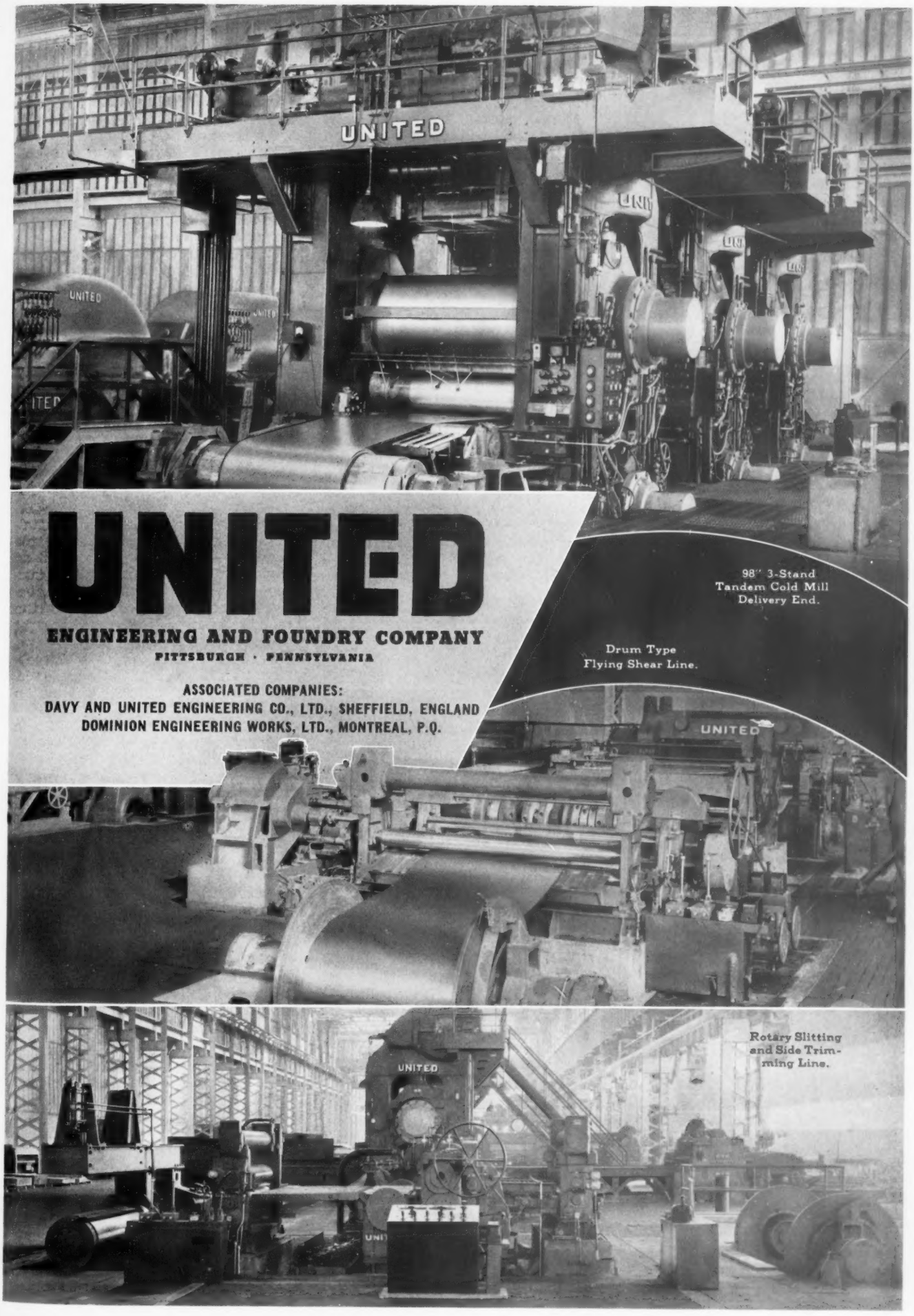
Considerable new matter has been added and this edition includes information on reinforced concrete, foundations on poor soil, rafts, piling, methods of underpinning, habits of the wood worm and powder pest beetle, together with methods of dealing with the pest; cost of building, various methods of arriving at the approximate cost of buildings, by cube, square, unit proportioned value, and rough quantities.

The editor's aim throughout has been to treat in a concise and practical manner all modern building developments so that the architect or builder shall find concentrated in the book a note of all those matters which are not to be found elsewhere.

Quality of Steel Wire Improved by Research

■ An article written by H. C. Boynton, metallurgist, John A. Roebling's Sons Co., Trenton, N. J., and appearing in the "Progress in Steelmaking" section of STEEL for June 20, reviewed recent improvements in the manufacture of steel wire. Through a printer's error, the concluding paragraph of the article, on page 72, was so mutilated as to be meaningless. This paragraph should have read as follows:

"It is interesting to note the number of wire manufacturers who are relying upon the facilities of a modern research laboratory to insure the quality of their product. Most large plants have their own research departments; those which do not generally make it a point to consult one of the well-known commercial research laboratories when necessary. In this way, the industry adapts the knowledge developed by science to the manufacture of a constantly improving quality of wire."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Metallic Resistors Withstand Extremely High Temperatures

BY W. TRINKS

■ INVENTORS among the metallurgists have attempted for many years to produce resistors which can be used in industrial furnaces for temperatures exceeding 2200 degrees Fahr. For many years these attempts were unsuccessful and it is only lately that such elements have been on the market. The best known element for high temperatures consists of silicon carbide, which, however, has the drawback of changing its resistance very rapidly; as the men in the mill put it, it "ages rapidly." Metallic resistors containing aluminum have appeared on the market, under various trade names, but they likewise have their shortcomings.

When the writer was told in December, 1936, by Dr. Schwarzkopf of Austria that he had a metallic element that had successfully operated in air at temperatures up to 3000 degrees Fahr. the writer ventured to express his doubt. Dr. Schwarzkopf then offered to send a furnace with such elements over to the United States and have the writer operate it so as to satisfy himself that the statements were correct. With the permission of the authorities of the Carnegie Institute of Technology, Pittsburgh, the furnace was set up in the electrical engineering laboratory, where transformers were available.

Withstands Tests

The furnace was operated at temperatures of 2900 degrees Fahr. and higher from Oct. 26 to Nov. 12, 1937, with only one short interruption. During this period the furnace interior was filled with various sorts of gas, including hydrogen saturated with water vapor, hydrogen, sulphide, petroleum vapor, carbon monoxide and carbon dioxide. Operation of the furnace was terminated on the date mentioned because the writer was convinced that Dr. Schwarzkopf's claims were borne out by results of these tests.

Each resistor consists of a metal rod or wire, which is mainly molybdenum. This is surrounded by a thin layer of metallic oxide, or a mixture of metallic oxides, consisting mainly of beryllium oxide. That layer is again surrounded by a thin shell of sillimanite which varies in composition from the inside to the outside. The theory underlying this element is the following: Molybdenum oxidizes freely at temperatures as low as 1000 degrees Fahr. The oxide has a high vapor pressure and wanders off, leaving metallic molybendum exposed to further oxidation. If the molybdenum wire is surrounded by a layer of oxide and if the oxide is of such a nature that the metallic base wants the oxygen more badly than the molybdenum wants it, then the molybdenum is protected against oxidation; if the outer layer is reasonably gas-tight, free oxygen will have a hard time penetrating to the molybdenum core.

Not New

It may be remarked that metallic resistors enclosed in a ceramic shell are old, and were tried out as early as 1923-24, but did not succeed because the oxide layer between the ceramic shell and the metallic core had not been thought of at that time.

While the furnace was under observation it was found that one element had burned out. This mishap was caused by a crack of the sillimanite shell near one end of the element. This reason appeared to be the following: In order to avoid too sudden a change in temperature from the water-cooled terminal to the white-hot glowing section of the element, the terminal ends are provided with extended sleeves, the extension having a length of approximately one inch. Two of these water-cooled copper sleeves apparently were leaky, and the water could drop on the elements near the end. This mishap had nothing to do with the element itself and can easily be avoided by testing the water-cooled parts of the furnace under pressure.

Since several layers or strata of material are used in the construction of this element, the investor calls it "Stratit," which is pronounced "strateet," with the accent on the second syllable. The Stratit element, now being manufactured in the United States under the supervision of Dr. Schwarzkopf by the American Electro-Metal Corp., Lewiston, Me., is without doubt a great step forward in the art of making electric resistors for high-temperature furnaces. In common with other elements it has the drawback that a considerable part of the heat is lost in the water-cooling of the ends. It

"Beautified" By Welding

■ **Beautiful, smooth rounded outside surface of this water tank and its main supporting ribs was made possible by use of welded construction. Appearance of this tank at Montgomery, Ala., is further enhanced by aluminum paint. Photo courtesy Aluminum Co. of America, Pittsburgh**

has, however, the advantages of not changing its resistance with time (in other words, it does not age), and of remaining rigid even at the highest temperatures. The elements of the furnace operated by the writer were about 19 inches long and showed hardly any sag at the time the furnace was shut down.

Pocket Size Pyrometer Potentiometers Developed

■ Development work in connection with airplane motors, stratosphere planes, diesel engines on trains, and air conditioning in trains has emphasized the accurate measuring of temperatures with precision instruments of the portable type.

Pocket pyrometer potentiometer widely used for development work on airplanes, automobiles and trains where motion usually makes such equipment inoperative. Photo courtesy Lewis Engineering Co., Naugatuck, Conn.

Widely used in much of this development work is the pocket size, portable pyrometer potentiometer developed by Lewis Engineering Co., Naugatuck, Conn. Actually fitting into an overcoat pocket, the galvanometer and main deflection instrument are of the double pivot type and damped so vibration does not affect the indication. No leveling or balancing is necessary.

When used with standardized thermocouple material, overall accuracy of instrument and thermocouple is 1 per cent of total scale deflection and instrument is easily readable to ¼ per cent. Cold junction is in the instrument and is automatically compensated by a bridge circuit so instrument accuracy is unaffected through variations in surrounding air temperature from —40 to plus 120 degrees Fahr. Accurate readings thus are obtainable even in the atmospheric range.

Standard scales of the pocket size pyrometer vary from a —50 to plus 150-degree range up to a high range of 75 to 3000 degrees Fahr. These ranges include those suitable for covering exhaust temperature, oil temperature, and direct and differential cooling temperatures.

A second portable pyrometer of similar design, only slightly larger, can be used to measure a wide range of temperatures. For example, in aircraft work, it measures cylinder head temperature averaging 450 degrees Fahr., oil temperature 180 degrees, carburetor air temperature 34, cabin temperature 74, free air temperature which may run as low as —30 to —60 degrees, and by using a specially constructed selector switch, as many as 28 thermocouples may be read in rapid succession.

Both instruments have no copper error, due to use of a special circuit. Both also can be used to measure differential temperatures, an important feature in aircraft and automotive work where it is desirable to determine cooling efficiency of liquid-cooled engines. Temperature difference between water flowing into and out of the radiator is quickly read, and by throwing a switch actual engine temperature is obtained. Other applications of differential measuring are in refrigeration, air conditioning, measurement of heat flow from one metal to another, or through insulation.

Larger instrument also is made as a hydrogen ion potentiometer. Due to 8-inch scale, no reversing switch is necessary as neutral point, 7, is in center of scale. Thus, sample may be either acid or alkali and still be balanced.

Adds Double Hose

■ B. F. Goodrich Co., Akron, O., announces a new oxy-acetylene hose known as Duoweld. It consists of two strands of ¼-inch, 2-braid hose with a corrugated cover which are molded together as an integral unit. It comes in standard 12½, 25 and 50-foot lengths.

Another "Axiom" Blasted

■ **Canvas gloves impregnated with neoprene was the answer that blasted the prevailing workmen's axiom—"work gloves don't last very long." A pair of gloves per day per workman is a considerable expense item. With gloves impregnated with chloroprene rubber, product of du Pont de Nemours, Wilmington, Del., the average life of a glove was extended to four and a half days, and in addition, has the qualities of rubber and yet resists deterioration by oils, greases, heat, chemicals and aging. Illustrated is a typical operation requiring the use of gloves. It consists of drawing copper rod through dies of smaller and smaller diameter until correct size is attained. Wire runs through a lubricating mixture of grease and soap before going through die. Photograph was taken in the plant of Midland Wire Corp., Tiffin, O.**

Reborn.. with

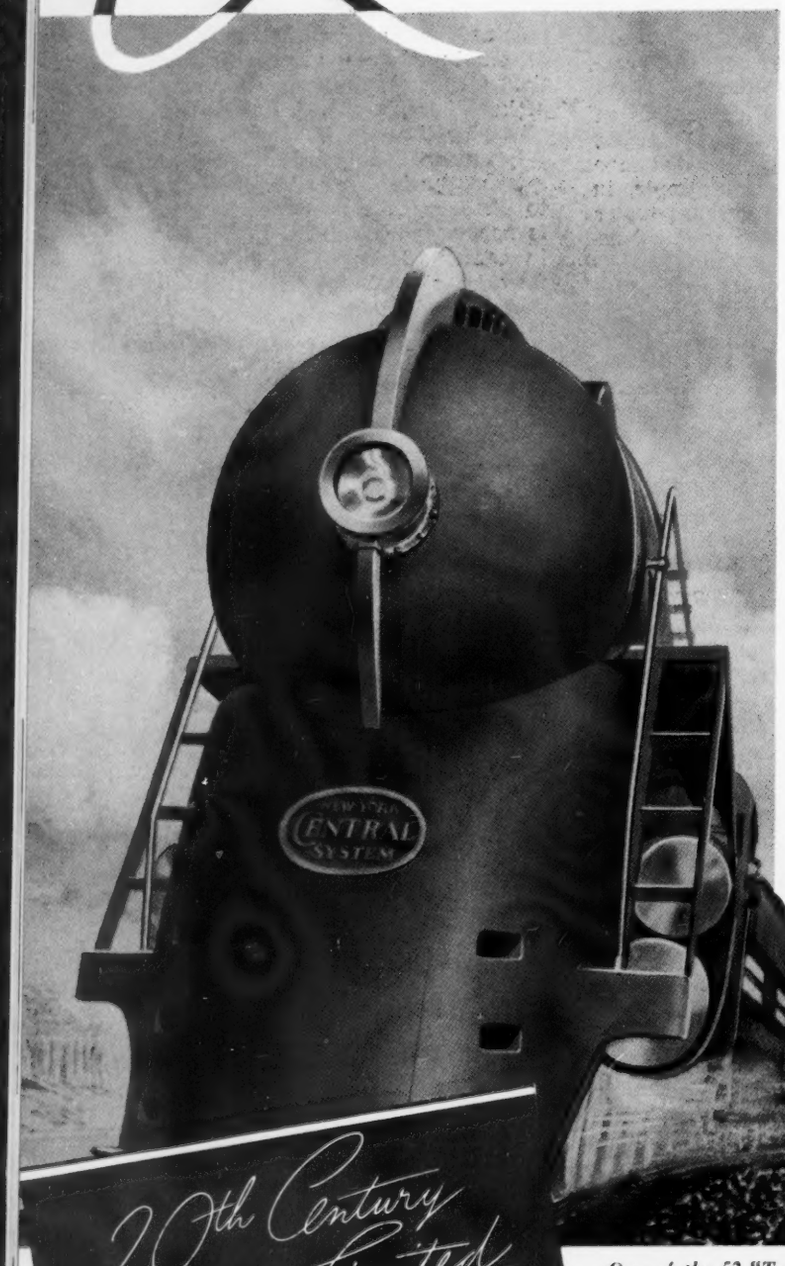
TWO HISTORIC TO MAKE NEW

PLACED in service June 15th, the new "Broadway Limited" and the new "Twentieth Century" are the first streamliners to run out of Manhattan. Both reach Chicago in record schedule time of 16 hours. Both trains have "roomette" Pullman cars. They are the first all-room trains in the U. S .A.

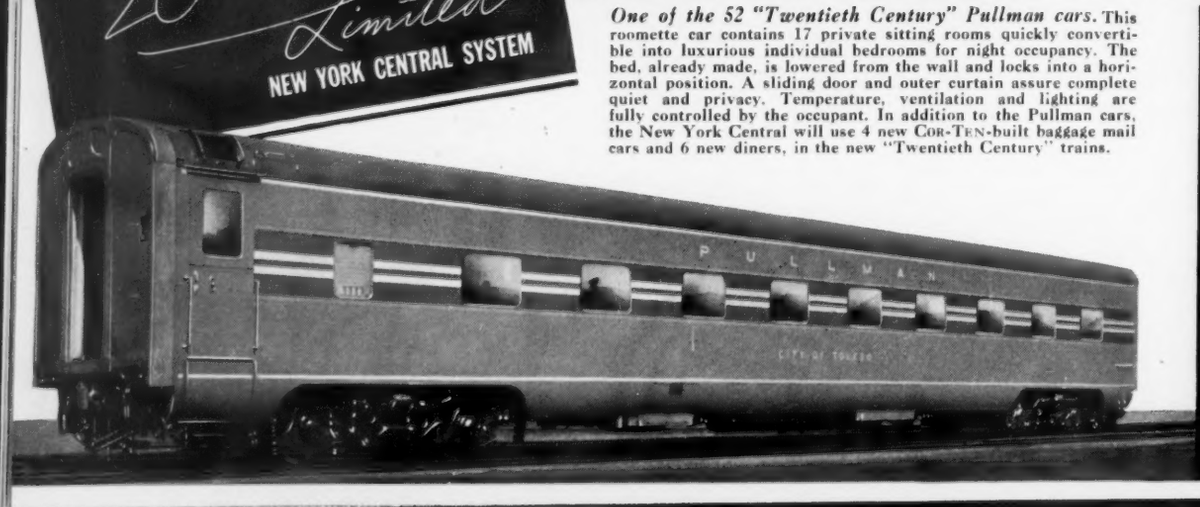
Scientifically lighted, air-conditioned, sound-proofed, the cars, built by the Pullman Standard Car Manufacturing Company, represent the last word in modern comfort, convenience and equipment. In their construction, U·S·S High Tensile Steels—COR-TEN and MAN-TEN—play a vital part in saving about one-third the weight of conventional cars, hence aid in effecting important operating economies—are a big factor in making possible the mile-a-minute 16-hour running time.

52 of these new COR-TEN built Pullmans will be made up by the New York Central into four complete "Twentieth Century" trains—two sections for each direction. The Pennsylvania will utilize 16 of the cars in "Broadway" service and will divide 36 of the same design and COR-TEN-construction among three other trains of its "blue ribbon fleet"—the "General," the "Spirit of St. Louis," and the "Liberty."

We are proud to add the names of these trains to the roster of modern, lightweight passenger equipment built of U·S·S High Tensile Steels. The list includes the original "Zephyr" of the Burlington, the "Flying Yankee" of



20th Century Limited
NEW YORK CENTRAL SYSTEM



One of the 52 "Twentieth Century" Pullman cars. **This roomette car contains 17 private sitting rooms quickly convertible into luxurious individual bedrooms for night occupancy. The bed, already made, is lowered from the wall and locks into a horizontal position. A sliding door and outer curtain assure complete quiet and privacy. Temperature, ventilation and lighting are fully controlled by the occupant. In addition to the Pullman cars, the New York Central will use 4 new COR-TEN-built baggage mail cars and 6 new diners, in the new "Twentieth Century" trains.**

U·S·S HIGH TENSILE STEELS U

U·S·S COR-TEN

TRAINS PREPARE RAILROAD HISTORY

the Boston and Maine, the Santa Fe "Super Chief"—all built of U·S·S Stainless Steel. The "Abraham Lincoln" of the B. & O.; the "Rebel" trains of the Gulf, Mobile and Northern; the "Green Diamond" of the Illinois Central; the "Hiawatha" of the Chicago, Milwaukee, St. Paul and Pacific; the streamlined coaches for the New Haven, for the Boston and Maine, the Canadian National Railways and others; the recently completed "Challenger" cars for Chicago and North Western and for the Southern Pacific — all COR-TEN-built. And the two 12-car "Daylight" trains for Southern Pacific, with COR-TEN framing and U·S·S Stainless sheathing.

To date more than 600 modern passenger coaches and Pullmans in service on 20 railroads, are definitely proving the economic advantage of lightweight equipment built of these stronger, more enduring U·S·S High Tensile Steels. When you rebuild—when you order new equipment, eliminate the useless expense of dead weight. Build lighter. You can do it most *economically* with COR-TEN, MAN-TEN and U·S·S Stainless Steels.

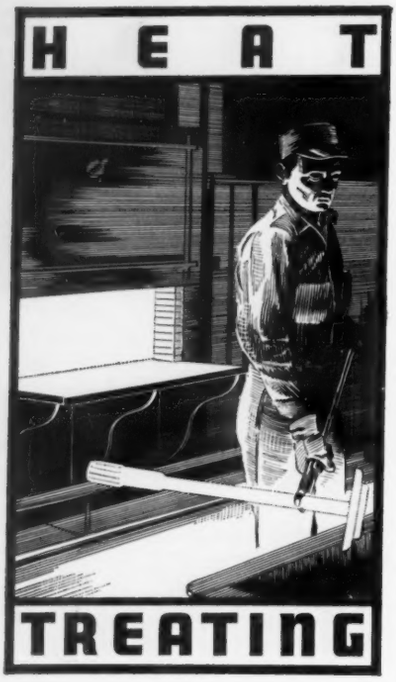
AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Products Company, New York, *Export Distributors*
Scully Steel Products Company, *Warehouse Distributors*

52 cars like this for the Pennsylvania Railroad are built of U·S·S High Tensile Steels assembled by welding to produce exteriors perfectly smooth, combining greatest rigidity and strength with reduced weight and minimum air resistance. These cars comprise 13 roomette cars containing 18 roomettes, 2 roomette-bedroom cars, 6 drawing room compartment bedroom cars, 9 double-deck duplex bedroom cars, 11 room lounge barbershop and bar cars, 4 bedroom cars, and 7 observation cars, 4 of which have master bedrooms.

Broadway Limited
PENNSYLVANIA RAILROAD

USS

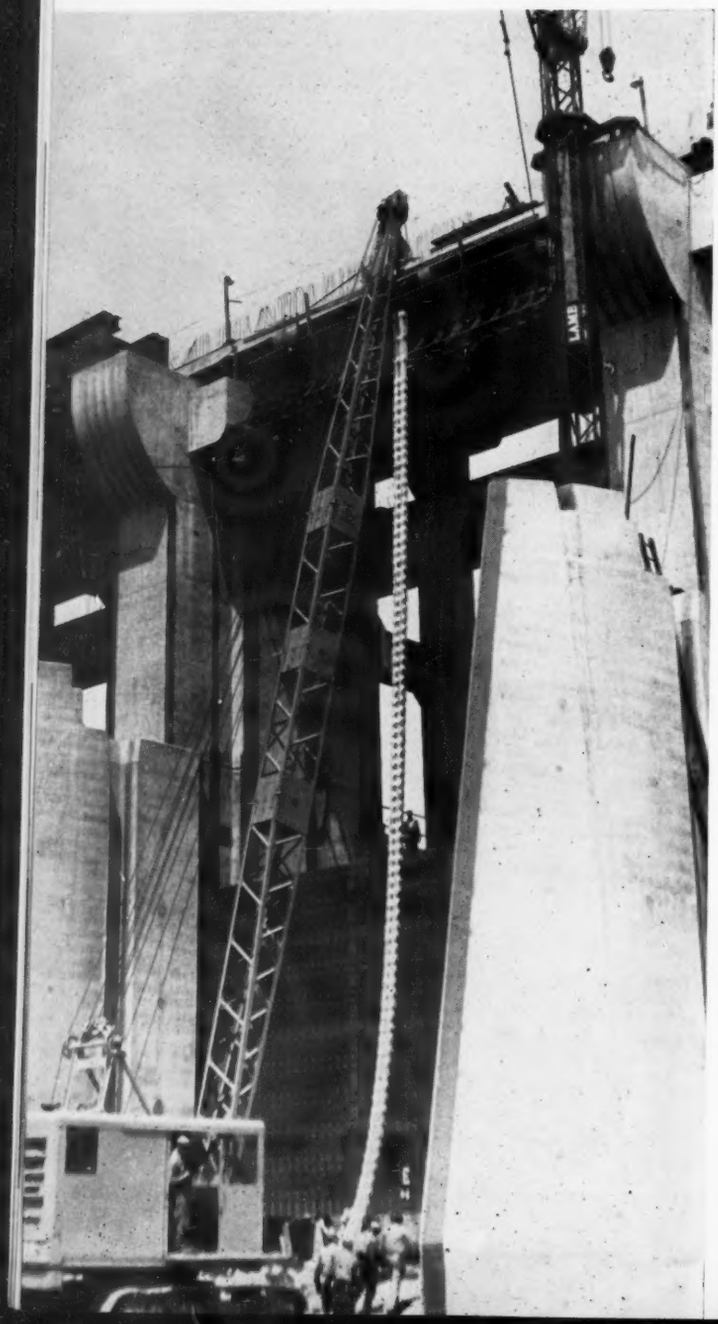
S UNITED STATES STEEL



Dam Chains

Making 32 chains, each weighing over 10,000 pounds, involved heat treating on production basis. The 138,000 pieces were handled in moving hearth and chain-mesh conveyor furnaces

By C. W. SHATTUCK
Chief Engineer
McKiernan-Terry Corp.
Dover, N. J.



■ McKIERNAN-TERRY Corp., of Dover, N. J., contracted to manufacture a number of extremely large chains for raising the spillway gates of the dam at Fort Peck, Mont.

American Metal Treatment Co., Elizabeth, N. J., was chosen to do heat treating of the individual links, and because of the production involved and the limited time available this proposition presented quite a problem. There were 32 chains in all, measuring 67 feet 2¾ inches each and weighing somewhat over 10,000 pounds each when assembled.

In addition to the production and time factor, all parts were subject to the usual rigorous specifications with which all who have had any experience with heat treating for any of the U. S. government departments are well acquainted.

The steel specified was SAE 3140, and McKiernan-Terry Corp. selected two heats of steel of closely corresponding analysis from which all links were fabricated.

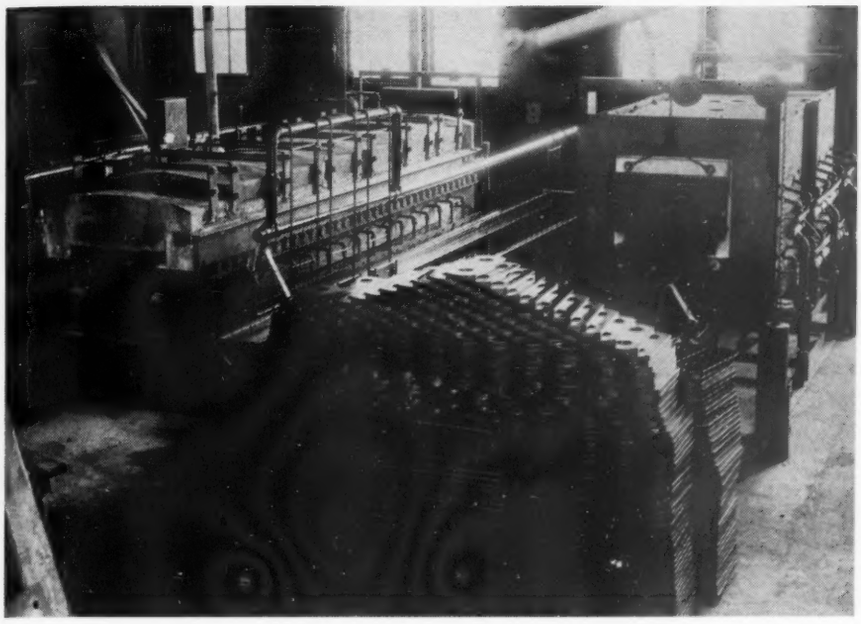
The next problem involved making the proper allowance for size change upon heat treatment. This was established by careful preliminary tests before production was started. In this way, it was possible to have definite assurance that the holes would all clean up when ground on the proper centers to give a chain with the correct pitch.

One other angle on this job was that completed chains were to be delivered as quickly as possible. It was, therefore, impossible to put through all the links of one size and then proceed to the next part. It was necessary to jump from one size to another frequently as the parts were fabricated.

The number of pieces, size of pieces and weights were as follows:

	Approx. Weight Each in Pounds
262 pieces	43.8
390 pieces	15.84
585 pieces	31.68
5138 pieces	8.43
7580 pieces	16.86

The equipment which was set up for heat treating these chains is shown in the accompanying illustrations. The hardening furnace is of the roller conveyor type with an available width of 24 inches, length 12 feet. All rollers are driven by means of roller chain.



Links in foreground are heated in roller hearth furnace at left, quenched in tank between furnaces and tempered in mesh-belt conveyor type furnace at right

The burners are manifolded in three independent sections and are on automatic control for extreme uniformity. In this way, the heating time, temperature and atmosphere are all under accurate control.

Charging is by hand with hand discharge into the quenching tank. The operator who quenches the work removes the links individually, placing them in an especially designed fixture for submerging in the oil. A hook could not be used through the holes of these heavy chain links as it would mar the holes to such an extent that they would not clean up on grinding.

After quenching, the fixtures are hooked onto a rack and allowed to remain for a few moments. They are then advanced to the opposite end of the quenching tank where they are removed, allowed to drain and then placed on the conveyor of the tempering furnace.

Holds Temperature

The quenching tank is approximately 15 feet long by 2 feet wide by 3 feet deep, and the oil in it is held at temperature by means of a circulating pump with the cooling coils located in a sump outside the building.

The tempering furnace is of the mesh conveyor type with an available width of 16 inches, length 8 feet. This furnace is over and under fired for extreme uniformity, and automatic temperature control is employed.

Three men took care of loading the hardening furnace, quenching, loading and discharging the tempering furnace, stacking the finished parts, etc.

The control for the hardening and tempering operations consisted in putting aside links for Rockwell hardness tests every two hours. These pieces were ground before testing and showed an average reading of Rockwell C-55 after hardening. With this inspection and control, it was possible to hold the Rockwell "C" hardness of the finished links within three points.

As is more or less customary on production jobs, using continuous furnaces, dummies were put through at the beginning of the day to insure that all links from start to finish were treated alike.

Changes Easily Made

A particular advantage of the equipment employed was the fact that a change could be made from one size of link to another size without interrupting production.

The gas consumption varied according to the length of the operating day, which in turn was controlled by the work ahead; however, a figure as low as three cubic feet per pound of work hardened and tempered and including a prorated portion of the gas required for heating the furnaces to temperature was achieved.

The average production was between 400 and 500 pounds of work hardened and tempered per hour.

When this entire job was finished, it was found that without the benefit of selective assembly the overall length of the chain did not vary more than 0.035-inch despite the fact that the length of each chain was 67 feet 2¾ inches.

While credit for this accuracy is primarily due to the grinding of the holes in these links, etc., the heat treater and his equipment are also deserving of considerable credit for keeping the size change in the pieces within such limits as to permit the holes cleaning up upon grinding. This is especially true when it is considered that not hundreds but thousands of these pieces were treated over a period of several months.

♦

Job Ticket Wrong but Blanking Die Saved

■ Soon after installing controlled-atmosphere hump-type hardening equipment, its user was asked to harden a blanking die for an outside firm. The job ticket said it was high-chromium, high-carbon steel with its critical at about 1550 degrees Fahr., according to a recent publication by Leeds & Northrup Co., Philadelphia.

Operator turned on Vapocarb atmosphere at 1200 degrees, adjusted furnace rheostat, set temperature-difference control so furnace temperature would lead tool temperature by about 60 degrees, and went ahead with other work. Watching the record curve and not expecting a hump to appear until die reached about 1550 degrees, the operator was astonished to see the curve break sharply about 100 degrees below this figure, unmistakably the beginning of a hump.

It was evident that regardless of job-ticket, temperature or any other factor, the hump showed the die to be in its critical. Being there at 1400 degrees indicated die could not be tool steel but instead was a non-deforming, oil-hardening alloy—a logical steel for a blanking die and one that should be quenched about 90 degrees above the low hump whereas high-chromium high-carbon steel would be quenched about 225 degrees above the high hump. It was decided to quench as the hump indicated.

Job ticket turned out to be in error but without the hump to detect it this die probably would have been ruined. As it was, die was drawn at 450 degrees Fahr., emerging with a hardness of 64.5 Rockwell, and gave excellent service.

Adds to Valve Standards

■ Manufacturers Standardization Society of the valve and fittings industry, 420 Lexington avenue, New York, announces the addition of addendum No. 1 to SP-25-1936. It provides for standard marking of ring-joint gaskets and flanges and also supplies, a standard service symbol for air, expanding the field of application of the MSS standard marking system for valves, fittings, flanges and unions.

Long Turnings Are Shredded

■ LONG TURNINGS are bulky, averaging only 5 to 10 pounds per cubic foot compared to 75 pounds per cubic foot for short turnings, and so it is profitable for many plants to employ shredders to cut up such turnings. Practice at the new Chevrolet motor and axle plant, Tonawanda, N. Y., is typical of that of many automobile plants. Here a battery of three ring shredders handles from 15,000 to 21,000 pounds of turnings per hour.

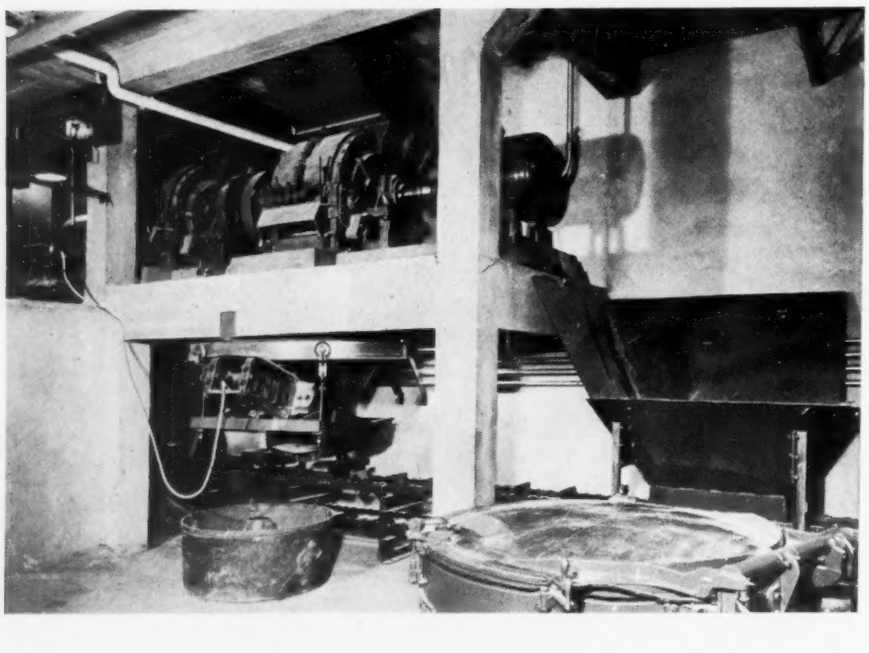
Number of Advantages

Shredders are found to have a number of advantages in this plant. Smaller turnings facilitate handling operations, storage bin problem is simplified, oil can be reclaimed more easily and the difference in market price between long and short turnings is about sufficient to cover cost of shredding, so the other advantages are clear gains.

Each ring shredder at the Tonawanda plant weighs 13,500 pounds and is driven at 900 revolutions per minute by a 50-horsepower motor. The long turnings are dumped into a 30 x 40-inch hopper opening at top of machine and fall onto the rapidly rotating shredder rings which break the material against the grinder plate, after which it passes across the grate bars and out onto an apron conveyor for transfer to storage.

Shredder rings have 2-inch faces slotted around entire circumference and break up turnings by an impact, rolling and grinding action. Six rings float on each of four outer shafts supported on a rotating spider. Rings have 4-inch radial motion, permitting passage of heavy pieces such as bar ends, bundles and other tramp material inadvertently mixed with the turnings.

Two shredders on balcony each have 24 whirling manganese steel rings to break up long turnings. Short turnings then emerge from shredder onto conveyor. Right foreground shows centrifugal chip dryer which reclaims oil



Publishes Papers On Tin Researches

■ International Tin Research and Development Council, 149 Broadway, New York, has issued three technical publications available without charge. They are:

Technical publication Series A, No. 67, "Some Differences Between the Structure of Electro Deposited and Hot-Dipped Metal Coatings," by D. J. Macnaughtan, describes work done to ascertain fundamental differences between these two types of coatings.

Technical publication Series A, No. 68, "The Influence of the Difference of Orientation of Two Crystals on the Mechanical Effect of Their Boundary," by Bruce Chalmers, shows effect on mechanical behavior of boundary between crystallites in metal specimen is important for understanding strength of polycrystalline metals.

Third publication is Series A, No. 69, "Calorimetric Determination of Tin by Means of 'Dithiol'," by R. E. D. Clark, describes new procedure developed using commercial Dithiol instead of the substituted benzine dithiols originally employed.

Steel Retains Color

■ Clark Thread Co., Bloomfield, N. J., has installed several stainless steel tanks as part of its dyeing equipment. Broad field of application is the principal reason given by the plant superintendent. The metal can be utilized in all types of work, retains true color values, is easily cleaned and found more durable. Type of steel used in their fabrication is Enduro stainless steel, product of Republic Steel Corp., Cleveland. The tanks were fabricated by Hussong, Walker, Davis Co., Philadelphia

Forgings For Pumps

(Concluded from Page 34)

and after fitting the two sections were reamed together in order that a very accurate alignment could be maintained in the assembled shaft. After reaming, each hole was fitted accurately with a 2¾-inch turned stud bolt. When each shaft consisting of three sections had been assembled, it was put in a 65-foot lathe and indicated at 18 or 20 points. An assembly of this nature, 41 feet long, did not run out more than 0.0015-inch at any place in this entire length. This precision is required in order that vibration and bearing wear will be at minimum.

After indicating and passing by inspectors, the impeller shafts were sent to the pump manufacturer for assembly with the pump impellers. The intermediate shafts will be shipped to the point of installation, Eagle Mountain and Hayfield stations, where they will be fitted to the motor shafts.

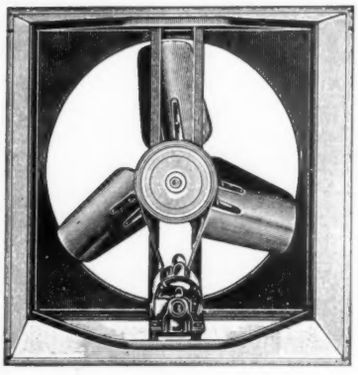
For shipment the shafts were given a heavy coat of corrosion protection compound before being covered with wooden lath as a protection against bumps and scratches.

NEW METAL PRODUCTS

■ A fan which exhausts the accumulated hot air from the living rooms through the attic has been introduced by Emerson Electric Mfg. Co., St. Louis.

Among the features of the home cooler is included a 2-speed capacitor-start, induction run, resilient mounted motor with built-in thermal overload motor protector. Motor of the unit requires less than 20 amperes with armature blocked on 110 volt, 60 cycles current, making it applicable to the home circuit.

The fan is mounted on special thrust-type ball bearings which are also cushioned on rubber. The fan case, in which the fan is shipped,



forms a part of the plenum chamber, and with each fan is packed six sponge rubber cushion blocks for insulating the fan from the attic floor.

When the fan is operating on free air, on high speed, it delivers air at 12,800 cubic feet per minute. On second, it throws air at the velocity of 8600 feet per minute.

■ United Cinephone Corp., Long Island City, N. Y., has introduced an Orthoplane lighting system which can be utilized for direct, indirect, specular or diffused lighting.

The unit comes in two models, No. 24 and 48, the former being 24 inches long and uses 2 bulbs while the latter is 48 inches long and uses 4 bulbs. The reflectors are fabricated of metal and have a baked gray enamel finish on the outside. They are adapted for use in schools, factories, laboratories, motion picture studios and machine shops.

■ A new gas range with built-in electric cooker and "pop-out" valve control was recently announced by Tinnerman Stove & Range Co., Cleveland. Ordinary house current is all that is required for the electrical apparatus.

Valve handles of the unit are concealed in the upper left hand compartment. When the door is opened these valve handles automatically move forward and remain within easy reach. The door is constructed so as to permit its complete closing while the range is in operation without interference with the controls, or left open at the automatic stop position.

Upper left compartment of the range has a built-in electrical element controlled by a 3-way switch with high, medium and low heat. Upon this electrical element rests a 5 quart aluminum cooker with 3 insert pans. Cooker is built with a heavy insulated jacket and insulated cover. It is thus designed to be used either on the top burners of the gas range or on the electrical element.

A sturdy wire basket is also provided to be used for warming plates and dishes when the portable cooker is not in use. For this purpose the switch is set at low, the object of which is to enable the housewife to

bring foods to cooking temperatures quickly on the top gas burners, and then place the cooker on the electric element.

■ Improvements involving conversions of structural assemblies to malleable iron castings have been embodied on the line of oil pumps built by Lufkin Foundry & Machinery Co., Lufkin, Tex.

According to the manufacturer, these changes are important from the standpoint of efficiency and durability. An example is found in the brake operating mechanism which is now composed of four malleable iron castings. These include one large quadrant, lever, pawl and pawl release grip, all designed for specific functions at hand, and to minimize assembly and machine work. Holes are cored, and the teeth in the quadrant are cast.

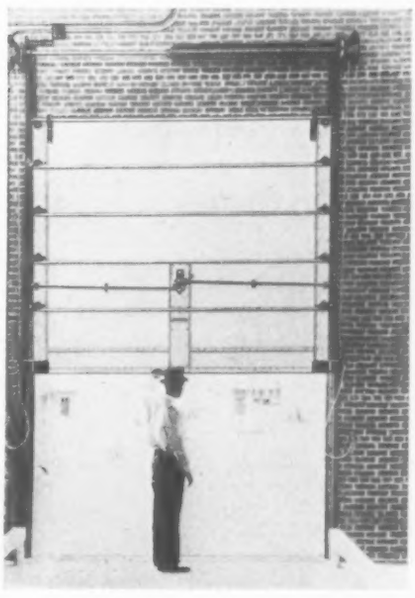
■ A new sealed action frame that provides for quieter operation and maximum protection against dust and injury is a feature of the new typemaster portable typewriters introduced by Underwood Elliott Fisher Co., New York.

Touch tuning, unobstructed typing visibility, complete accessibility to type bars and ribbon spools, keyboard controlled ribbon shifting device and a back spacer on the left hand side of the machine in normal typing position are other advantages.

■ A vertical sliding all-steel Rol-Top door has just been introduced by Kinnear Mfg. Co., Columbus, O. The door is suited for industrial or commercial purposes.

Door proper is made up of heavy steel sections rolled from copper-bearing steel that has been galvanized by the hot dip process. Additional rigidity is provided by steel reinforcing plates at all points where hardware is applied.

Ends of these sections are provided with especially designed, hardened steel ball bearing rollers that travel in steel tracks that are applied to the jamb, and extend vertically along the wall. At the top of these vertical tracks is placed a torsion spring counterbalance, composed of an oil-tempered helical spring, operating around a solid steel shaft. The door proper is connected to this counterbalance mechanism by heavy plow steel cable which operates over drums at the end of the counterbalance shaft. The door is locked by a cylinder lock operating in conjunction with lock bars that engage in the slots provided in the steel track.



Design Is Keynote

Careful selection of material with special regard to the actual service required of each individual part produces a new high in strength and capacity per pound weight

■ BECAUSE trenching equipment then available was too heavy and cumbersome to permit use around sidewalks, trees, poles and hydrants, a Cleveland contractor was confronted in 1921 with the necessity of using hand labor almost entirely in digging a ditch for an extensive underground conduit project. To fill this need so forcibly called to his attention, he conceived and built a compact, light, easily maneuvered trencher.

Subsequent demand for these machines caused A. J. Penote, the contractor, to form Cleveland Trencher Co. to manufacture compact, light-weight trench diggers. Emphasis was placed on these two characteristics each time the machine was subsequently redesigned and today Cleveland trenchers figure prominently in this industry. Further, these machines incorporate most of the newly developed advances in alloy steels, forgings, bearings, heat treatments, clutch and gear mechanisms, etc., and are capable of giving high production under most severe conditions.

Low-Alloy Steels

A Cleveland trencher consists of a frame mounted on continuous crawler treads and carries a power unit which drives a circular digging wheel on which cutting teeth and digging buckets are mounted. The frame and boom which carry the digging wheel are channel and angle sections of low alloy, high-yield-strength steels, which combine maximum strength and rigidity with minimum weight. These are assembled by the electric arc welding method.

Crawler tread shoes are nickel steel, alloy castings, heat treated to give a hard surface with a tough core. Shoes are smooth surfaced and have provision for attaching steel or hardwood auxiliary cleats. Effective bearing pressure on the ground is 5.5 pounds per square inch with standard shoe 12 inches wide and only 4.3 pounds per square inch with auxiliary 16-inch cleats. These figures show how this machine can work on sidewalks and lawns without damaging them.

Shoes are connected with chromium-molybdenum, alloy steel pins working in bronze bushings pressed into the shoes. Pins are ground accurately to size and case hardened by the Chapmanizing method. Tolerances are plus 0.000 and minus 0.003-inch. Pins require no finishing after Chapmanizing in spite of the low tolerances. Pins from the heat treating process are clean and free of distortion.

Each crawler tread is driven by a sprocket which in turn is driven by a roller chain drive from the heavy duty differential mounted directly under the engine at the extreme front end of the trencher. Differential gives even loading of drive chains and maks possible a unique method of steering which is done through a single lever.

Fig. 1 — Lightweight, compact, machine easily digs ditches in close quarters at high speed. Heat treated alloy steels, welded construction play important part

Pushed in one direction, this lever actuates a brake on one side of the differential slowing down that side and turning the machine. Pushed in the other direction, brake on opposite side is actuated, turning machine in the other direction. Where guide lines must be accurately followed along all kinds of curves, this flexible smooth steering control is valuable.

Power unit consists of gasoline engine although diesels also are available. Developing a little over 38 horsepower, they permit economical operation and yet provide sufficient power for high digging rates as over 90 antifriction bearings guard against friction losses and thus help apply full developed power to cutting edges. The engine drives through a master, single-plate, dry-disc clutch into the main transmission which makes four speeds forward and a reverse available at the main shaft from which digging wheel and boom hoists are driven.

Thirty-two Speeds

Power also is transmitted from this main shaft to a second, selective, sliding-gear transmission which provides eight speeds forward and two in reverse to make a total of 32 speeds forward and two in reverse available for driving crawler treads. These speeds are necessary to give highest possible production in all types of earth as digging wheel speed is set by the first transmission so that forward speed of the trencher then is determined by the crawler transmission which must have a wide speed range available to accommodate all possible combinations. It is this flexibility which largely accounts for the effectiveness of these diggers.

Intermediate and reduction gears of crawler transmission are chromium-molybdenum, alloy steel, machine cut and case hardened. Ball, roller and tapered roller bearings are used throughout. Entire machine contains a total of more than 90 ball, roller, tapered roller and needle bearings, many with integral waterproof seals built in. No babbitt bearings are used.

Crawler transmission housing, shown in Fig. 2, is welded from steel plate and entire transmission sets where it can easily be removed when necessary. Gears run in oil and housing is sealed with leather oil seals. Final drive is through needle-bearing-mounted universal joints to crawler differential which is heavy duty, worm gear type, enclosed in a cast steel housing.

Rims or flat sides of digging wheel are torch cut in one piece from ½-inch steel plate. These rims carry 14 digging buckets of welded alloy steel, bolted on to facilitate replacement. Cutting teeth bolted to buckets are drop forged, chromium-vanadium steel, tipped with welded-on hard-surfacing material which has been found to increase wear resistance by 300 to 400 per cent. Center cutters of high-carbon steel also are used.

Digging wheel is driven by alloy steel segments riveted to each side which mesh with a special drive sprocket. These two sprockets, shown in Fig. 3, receive terrific punishment as entire force required to turn digging wheel is concentrated on a few teeth on these sprockets and in addition they are exposed to constant abrasion from dirt and soil as well as to atmospheric deterioration. To withstand this service, they are made of SAE 6150 steel, forged and heat treated to a hardness of 477 brinell. As wear is concentrated on these sprockets, they are made split in halves which are bolted in place providing quick, easy replacement when necessary. The high shock resistance of forgings is valuable here as severe shock loads are encountered by these sprockets.

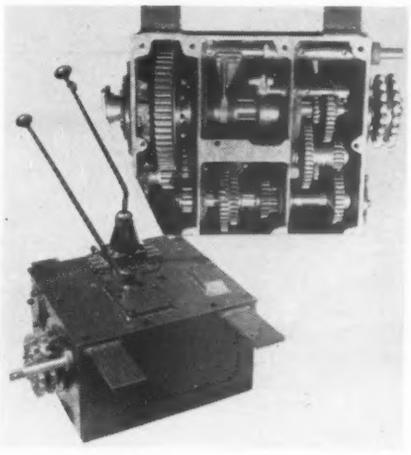


Fig. 2—Showing welded gear case and gears in special 8-speed crawler transmission

Other important forgings are the three pairs of small, alloy steel, guide wheels which position the large digging wheel at three points on its inside circumference — at two points on the boom and at a point near the bottom of the wheel. Bearings at these points are dual-thrust, roller-type with waterproof seals. Other places where forgings are utilized include bearing boxes, split sprocket hubs, levers, yokes, pins and sprocket blanks. Steel for these varies from SAE 1020, 1045, 2335, 4145 to 6150.

Fig. 1 shows the drive system to digging wheel. Engine drives main shaft through a master clutch and a standard 4-speed transmission previously mentioned. Main shaft drives heavy-duty, worm-gear type differential through the digging clutch. This differential is enclosed in a cast steel housing and equalizes pull on the two roller chains which drive sprockets operating digging wheel. Shown in Fig. 3, this digging wheel sprocket mounting also contains reversible enclosed spiral gears which operate the conveyor belt through a roller chain, dumping earth either to right or left of the unit. This housing is made from two sections of large steel pipe, accurately machine cut and welded together to form a one-piece case.

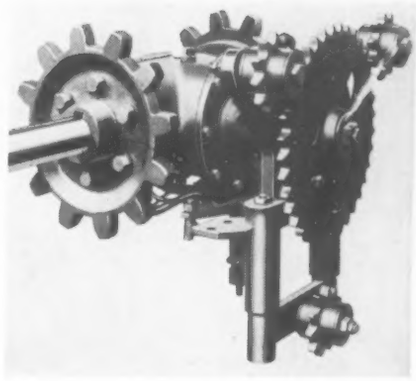


Fig. 3—Digging wheel sprockets and welded steel housing which contains spiral gears driving conveyor belt through roller chain and chain sprockets seen at extreme right

Dirt conveyor itself is quick-shift, arc-type, has a 24-inch belt and may be extended quickly to either side in passing near obstructions. Sealed ball bearings are used here.

Boom carrying digging wheel slides up and down rails held by A-frames which are part of main

Fig. 4—Ditcher in action. Welded alloy steel construction enables machine to handle tough production jobs such as overland pipe line work

frame of trencher. Either or both ends of boom can be raised or lowered through cables winding on drums connected through machine-cut positive clutches to a double worm-gear hoisting unit. This, in turn, is driven through a friction clutch connected to the main shaft below through a roller chain. Cut bronze worm gears with hardened and ground steel worms are used.

Parts of High Strength

Each of this multitude of parts is designed specifically to handle the loads it encounters. Type of steel, heat treatment, finish, etc.—all are studied in detail. Result is a trencher not only capable of handling work for which it was originally intended but which is so rugged that it now is widely used in excavating overland oil and gas lines on rough terrain and in sparsely settled country where a breakdown might be serious.

As an example, shafting in these machines is chromium-molybdenum or chromium-nickel steel, fully heat treated, turned and ground. This produces strength substantially equivalent to that of a cold rolled, plain-carbon steel shaft double the cross section. Actual figures on a typical torsion test indicated 23,500 inch pounds for a 1.906-inch diameter chromium-molybdenum shaft against 23,000 inch pounds for a 2.625-inch diameter cold rolled shaft.

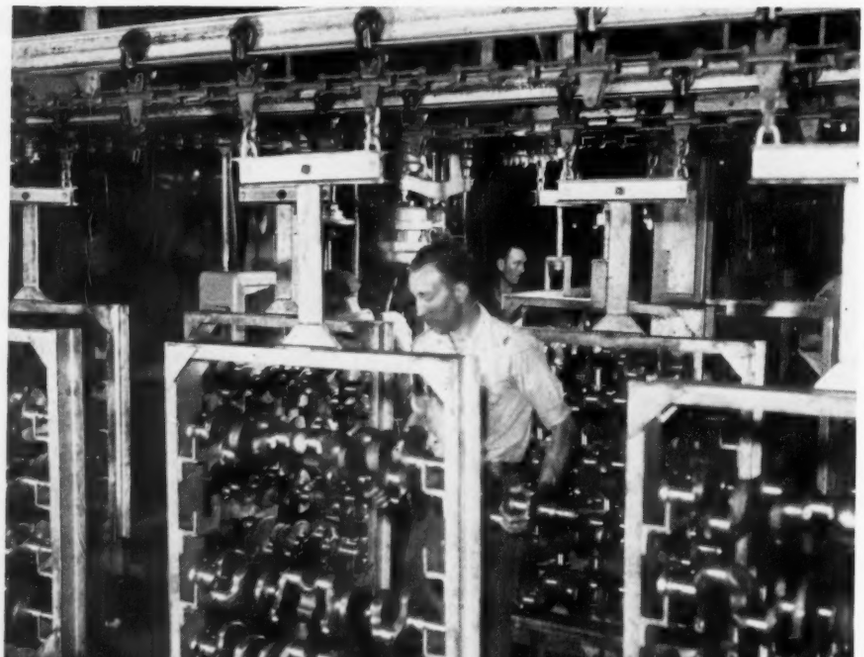
Similar savings made throughout the machine make possible a total net weight under 5½ tons, about one-third that of conventional machines.

This light weight in turn simplifies the problem of transporting the trencher to and from jobs. A trailer unit, arc-welded from alloy steel channel and angle sections, with a semi-3-point suspension on chromium-manganese, heat treated axles and mounted on dual wheels all around, makes it easily possible to haul the trencher with a truck at 30 miles an hour. Width between crawler treads is only 39 inches so machine does not take up more than its share of the roadway. It takes only a few minutes to load or unload from the trailer using two I-beam skids.

An important design feature of equipment such as this is the accessibility of all parts subject to wear or breakage to facilitate repairs and replacements when required. In addition to providing shear pins and similar protection to conveyor and digging wheel drives, parts subject to wear are all accessible. For instance, forged sprockets, shown in Fig. 3, driving digging wheel are each split in two halves permitting quick replacement without removing or dismantling any other parts. Similarly, guide wheels, transmissions, differentials and other parts are easily accessible due to the unit-type design employed.

Lubrication has received due attention as machine is completely equipped with industrial type, high pressure grease fittings. All housings are provided with plugs for oil level filling and draining. Many of the anti-friction bearings are fully enclosed with grease supply built in.

Crankshafts Handled Systematically



■ **Pontiac plant uses new overhead arrangement for moving crankshafts from one operation to the next. The line winds in and out between rows of machines, up and down aisles. Carrying frames, each accommodating four shafts, are permanent on the conveyor line**

Wetting of Metals By Molten Metals

■ E. J. Daniels and D. J. Macnaughtan review present knowledge on this subject, with particular reference to tinning and soldering, in Technical Publication, Series B, No. 6 of International Tin Research and Development Council, 149 Broadway, New York. Copies are available without cost.

Wetting is a chemical phenomenon akin to adsorption and although it has been closely studied in the case of liquids in contact with liquids, there is not much accurate information on wetting of metal surfaces and surface forces involved. Wetting occurs most readily when the metals concerned form compounds easily. For example, tin in quite small amounts enables lead or bismuth to wet copper.

There is a critical temperature above which each metal spreads rapidly and in some cases there is a period of induction before wetting occurs. Reference is made to the halo effect observed in the spreading of certain molten metals.

New Exhibit at Franklin Institute

■ Among recent exhibits opened to the public at Franklin institute is one donated by Ajax Electrothermic Corp., Trenton, N. J., showing the heating effect of induced high frequency currents.

All parts of the equipment for generating the current are visibly arranged in a glass case, enabling one interested to trace the circuits, and as he pushes a button, to see just what happens during the heating cycle. A note on the exhibit states that induction furnaces of 8 tons capacity are in regular operation producing steel, while approximately 100,000 kilowatts of energy have been installed for inductive melting, differential heating, surface hardening and other treating operations.

Plans are being made to place this exhibit permanently in the electrical group to the left of the entrance on the main floor of Franklin hall.

Refrigerator Shells

Thoughtful design, careful welding procedure and good workmanship combine to produce one-piece, welded steel cabinets which develop no defects when they are porcelain enameled

By R. M. JAMES

Rate & Cost Reduction Dept.
Westinghouse Elec. & Mfg. Co.
Mansfield, O.

■ WHEN ALL-STEEL refrigerators with a sealed outer shell finished in white dulux proved successful, the problem of producing a porcelain enameled cabinet along the same lines presented itself.

At first a steel inner shell or frame was formed and welded similar to the dulux cabinet and finished with dulux primer to prevent rusting. Food compartment and insulation were assembled into this shell. Porcelain outer shell then was assembled over this. Outer shell consisted of two drawn side panels and a drawn front panel, each of which required 10 to 12 press operations prior to porcelain enameling.

Shells Enameled

Next step was to make a complete shell that could be porcelain enameled and into which the food compartment and insulation could be assembled. Now this is done by folding a steel sheet to form the front and two sides. The ends of the sheet are folded around the rear corners so they project about 3 inches across the back. A flat sheet is seam welded across these ends, closing back of cabinet and thus completing a hollow shell. Operations involved are:

Door opening and lower front opening first are blanked out of 56 x 84 x 0.050-inch cold-rolled steel sheets. These are piled on a skid located in front and at left of the power press. Operators work in 2-man teams as sheets are too large for one man to handle. Each machine is located so operators will have shortest possible distance to carry sheets between operations. The number of 2-man teams required to fabricate the wrapper sheet into a refrigerator shell varies with production requirements. Ten men will turn out 50 shells per hour through the first eight operations. These ten men earn a substantial bonus under the incentive plan.

Fig. 1—Press brake with four notching dies is notching sheet which has been blanked out. Dies can be relocated for different size sheets

First team lifts a sheet from the pile with vacuum cups and turns it 90 degrees so it goes into press the narrow way. One man walks to back of press and places sheet end against gage while other man trips the press blanking out door opening and lower front opening shown in Fig. 1. Second man then goes to back of press and helps pull sheet through press, turn it 90 degrees and walk two steps to notching press.

This is a 10-foot press brake fitted with four notching dies of the subpress type that can be relocated for different size sheets. A sheet iron table at front of press brake supports both sheet and gages. All subsequent operations are gaged from the door opening. After notching top edge of sheet, operators turn it 180 degrees on the table and notch bottom edge. Top and bottom edges are identical. Top flange is offset in the third operation on a 10-foot press brake equipped with an offsetting die and a sheet-iron table fitted with an adjustable gage. This press, instead of being in line, is set at right angles to the notching press.

Save Motions

The first 2-man team places the sheet on a table in front of the offsetting press and returns to their starting point. One man removes scrap from blanking die in first press and places it on skid directly in front of press while other man breaks a new sheet loose from the pile. This completes their cycle.

Second team takes its place at the third press, places the sheet against gage in die and offsets top edge of sheet for top panel. After press is tripped they push the sheet through, go around the press, take the sheet by each end and carry it

Fig. 2—After blanking, notching and flanging, sheet is shaped on this equipment as shown in Fig. 3

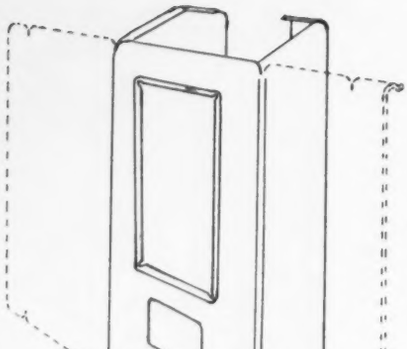


Fig. 3—This shows how sheet is formed to make refrigerator shell

to a forming press which forms the door opening flanges after which sheet is piled on a skid and men return to their starting point.

Skid load of sheets then is trucked to another building which also houses the enamel plant. Here skid is placed in front of a 10-foot press brake fitted with a die to form top and bottom corner flanges on a 1½-inch radius. Two operators place top edge of sheet in die and hold the door opening against a gage. After forming top flange, sheet is turned 180 degrees and bottom flange formed.

Operators then carry sheet to hand brake, turn it 90 degrees, place one end in position, gage, clamp, hold down and form the front corner as shown in Fig. 2. Next they release hold down, remove sheet, turn it 180 degrees, place other end in brake and repeat the operation of forming as shown in Fig. 3.

Two men carry this formed shell to a roller welder and place it in the fixture. Back sheet is placed in position across ends and locked. This welder is a special 80 kilovolt-ampere series-type seam welder. As shown in Fig. 4, it welds two seams simultaneously. The horizontal fixture is mounted on a reciprocating carriage which is rolled out from the welder making it easy to place refrigerator shell in position. When loaded welder is started and fixture carries shell under the two stationary revolving wheel-type electrodes. Welding current flows from transformer, through wheel electrode, to work, and back through other electrode to transformer. Timing is adjusted to produce a series of closely spaced spot welds. This operation welds the back sheet to the shell at each side but stops at the beginning of the 1½-inch radius at the top. Before shell is removed from fixture, seams at top radius are acetylene welded.

Corners Closed

Since both top and bottom corners have a tendency to gap open, it is necessary to round them both for appearance and to bring edges of the notch together for welding. A horn press fitted with male and female dies is used for all sizes of cabinets since all utilize the same 1½-inch corner radius. This press is mounted on a pedestal high enough for the largest shell. Two men place shell over die of horn press and bump one top corner. Without removing from press, shell is turned over and remaining top corners bumped in succession. Shell then is lifted from press, turned bottom up and bottom four corners bumped.

Fig. 5—Here top corner welds are being welded. Jig is lowered over top of shell

After bumping, corners are ready to be welded. Edges are in alignment and gap is approximately 1/32-inch. Two welders, working together, move shell under a welding fixture and lower fixture over top edge. Fixture is a light angle iron frame, suspended from the ceiling and counterweighted so it can be raised and lowered easily. Fixture squares shell for welding. The welders working on opposite corners acetylene weld two seams each, then invert the shell and repeat the operation on bottom corners as shown in Fig. 5.

Reinforce Corners

Subsequently shell is placed on its back on a roller conveyor beside the welding station and pushed along a few feet where another operator acetylene welds four gussets in the door-opening corners. The fixture used consists of three pieces of wire welded together, the longest being about 15 inches. Corner gusset provides a flange of full depth at the corners and thus reduces the possible hazard of porcelain enamel trouble.

Next the shell is pushed about 10 feet along roller conveyor to drilling station. A post drill mounted on the wall swings to any position over the shell. A skeleton template fitted with hardened steel bushings is laid over shell front. Beside the post drill is a shelf holding three small portable pneumatic drills.

Fig. 4—Seam welder makes two back seams simultaneously, fixture passing under wheels

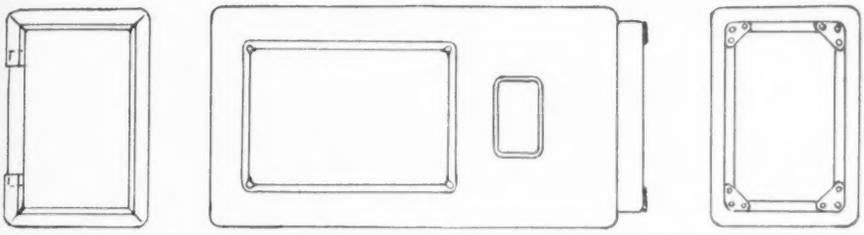


Fig. 6—Completed shell with sub-base assembled, ready for porcelain enameling

Operator drills the large ⅜-inch holes with the post drill, pushes it aside, then takes one after another of the small pneumatic drills, weighing between two and three pounds, and drills two to six holes with each. He removes front template, turns shell over, places back drill template in position and drills holes required there.

Next, operator places shell on a dolly which has ball-bearing swivel castors making it easy to push the shell into place to spot weld reinforcing braces at door-opening corners. A 30-kilovolt-ampere spot welder is used for this operation. Corner braces are used to strengthen corners of the door opening to prevent porcelain enamel from chipping due to a movement at the corner. No fixture is necessary as the operator holds the brace in position with one hand until one spot is welded. To prevent welding point marks on the outside surface, a copper strap 12 x 1½ x 3/16-inch is held over the shell so outside welding electrode contacts it instead of the work.

Sub-Base Added

After corner braces are welded, the next operator, as shown in Fig. 7, uses two portable pneumatic 6-inch disc grinders, one fitted with coarse abrasive and one with fine. He polishes the eight top and bottom corner welds. Shell now is ready for sub-base.

A 40 kilovolt-ampere press-type welder, fitted with special arms, is used to weld the sub-base to bottom flange of shell. Welder is mounted on a pedestal of sufficient height so shell may set upright on the floor for this operation. No fixture is used, alignment being in corresponding holes in the two parts. Fig. 6 shows completely fabricated shell with sub-base.

At next station, door-opening corner welds are smoothed. A flexible-shaft grinder fitted with a 2-inch polishing wheel 6 inches in diameter is used in the corners. After finishing weld metal, shell is pushed along to next station where mounting holes for cap or top are drilled with a small portable pneumatic drill, a light weight drill template being used to locate holes.

This completes fabricating operations and brings refrigerator shell to the inspector who checks it with gages for dimensions. He also goes over the surface and corrects any slight defects such as dents, scratches, etc. When the inspector passes it he moves it across the aisle to one of several lines of roller conveyors which lead to loading end of pickling machine and on to porcelain enameling department.

♦

Classifies Effects of Alloying Additions

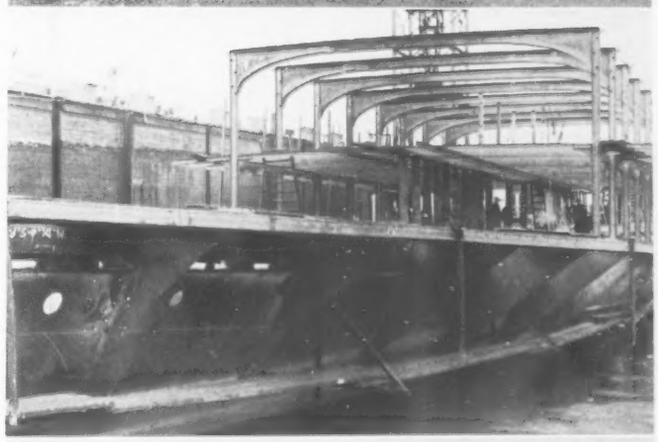
■ Alloying elements for steel may be divided naturally into three categories, namely: Carbide formers and deoxidizers, both of which groups are alpha (or ferrite) formers; and the austenite formers. This classification was set up by Dr. A. B. Kinzel, chief metallurgist. Union Carbide & Carbon Research Laboratories Inc., New York, in discussing specific effects of alloying additions before the Chicago chapter, American Society for Metals, March 10.

With this classification as a basis, the speaker indicated how the low-alloy, high-tensile, or mobile-structure steels are built up and balanced in composition and properties by suitable choice of elements. Under deoxidizers, he dealt with the newly developed complex type, such as the silicon-aluminum - vanadium - zirconium alloy known as Silvaz, as well as the more familiar ferro-alloys of silicon or aluminum.

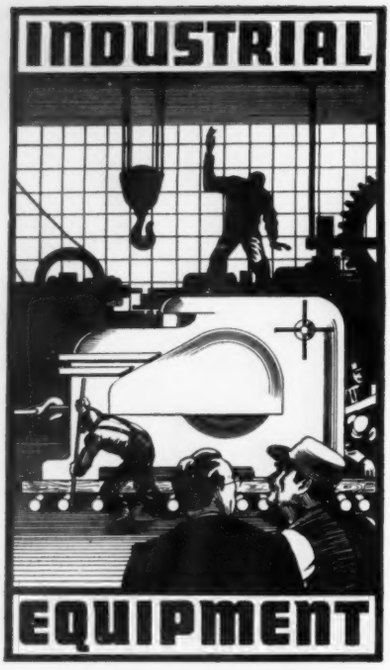
Balancing was shown to be not so important in the heat-treated alloy steels of the S. A. E. series. Just coming into industrial use for special purposes are several steels with good properties, these including the 3 per cent chromium, molybdenum-bearing steels with and without further additions of vanadium. The speaker gave special emphasis to the 4 to 6 per cent chromium steel containing molybdenum.

Dr. Kinzel gave a clear insight into all types of stainless steels, including those with the duplex ferrite-ustenite structures. He discussed the effects of columbium and nitrogen in stainless steel, and of the influence of ferrite when associated in various proportions with austenite.

A Boat Is Streamlined



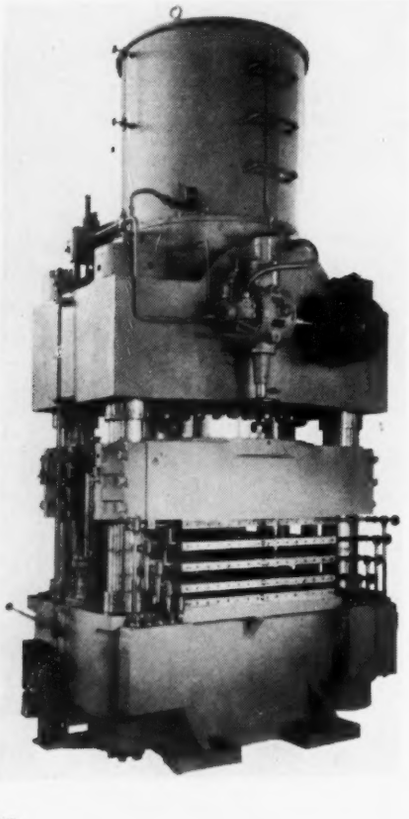
■ Top shows "City of Philadelphia" stripped to main deck; center, new deck extension and sponson bulkheads welded outside original hull; below, "streamlined" renovation is completed. Photos courtesy Maryland Drydock Co.



Hot-Plate Press Has 1500-ton Pressure

■ Hydraulic Press Mfg. Co., Mount Gilead, O., has introduced an HPM hydro-power hot-plate press of 1500 tons pressure capacity to its line for compressing or curing relatively thin materials in sheet or board form which require the combined application of heat and pressure.

The press is of the vertical, downward-acting, open rod type with a closed top pedestal bed. Platen of the unit is actuated by a main ram and two auxiliary Fastraverse rams.



Pressing surface of the platen and bed has an area of 48 x 48 inches with five hot plates of the same dimensions by 2 inches thick, equally spaced between the press platen and bed.

Fastraverse open circuit system is employed with a manual and automatic timed press travel control and single stage hydro-power unit. By using a high speed rotary pump of the radial plunger, oil pressure type, disadvantages are overcome by forming a mechanical relationship between valve pintle and cylinder rotor.

Breakdown of oil film between the pintle and primary rotor are prevented by improved construction, and the use of Timken tapered roller bearings with total dimetrical clearances less than the clearance constituting the space between the two moving parts.

Hollow Screw Wrenches Utilize Hexagonal Driver

■ Armstrong Bros. Tool Co., 317 North Francisco avenue, Chicago, has placed on the market a line of wrenches for hollow screws which resemble in general a detachable head of a socket wrench, but in place of a socket to fit over a screw head, they have a protruding hexagonal driver that fits the hollow screw.

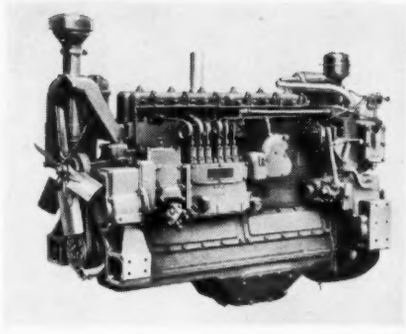
Ten sizes fit all hexagon nut hollow screws and cap screws from ¼-inch to 1-inch in diameter. An A1-100 set consists of 10 wrenches, 2 reversible ratchets, 3 sliding T-handles, 2 extensions and an adapter in a fitted steel case.

The wrenches, handles and extensions are made of chrome-vanadium tool steel. The reversible ratchets are drop forged with hardened steel gears, and, it is claimed, have an improved action. All wrenches and parts are chrome plated.

New Diesels Suitable For Small Plants

■ Caterpillar Tractor Co., Peoria, Ill., has placed on the market a line of industrial diesel engines of the 6-cylinder, 66-horsepower type designated as model D4600. The engine features solid injection of fuel into combustion chambers, and turns at 1400 revolutions per minute.

The engine is well suited for construction work or as a source of main or auxiliary power for small plants. It is offered as a unit with a 35-kilovolt generator at 50 cycles at 1500 revolutions per minute or as a 32½-kilovolt generator at 60 cycles at 1200 revolutions per minute. On jobs not requiring more than 50 horsepower the engine uses not more than three gallons of fuel.

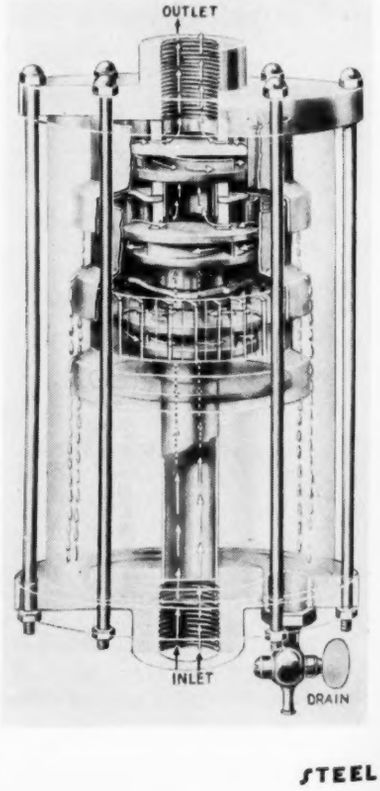


Injection pumps and injection valves are set at the factory and require no field adjustment. A 14-horsepower, 2-cylinder gasoline starting engine is mounted at the rear of the diesel, directly over the flywheel housing, having a governed speed of 3000 revolutions per minute. This engine cranks the main engine through a pinion and clutch arrangement which automatically disengages when the larger engine fires. For indoor installations, electrical starting is available.

Separator Eliminates Polution of Gases

■ Textite Corp., 2110 Roscoe street, Chicago, has placed on the market a Hager separator which eliminates possibility of polution and removes all water, oil, and dire, thereby delivering clean compressed air, gas or steam.

Entire unit is 10½ inches high by 6 inches in diameter and weighs 15½ pounds. Operation is affected by pressure of element passing



through the unit. The cleaning separation is obtained by linear deflection, jetting, centrifugal force, capillary attraction and sudden expansion.

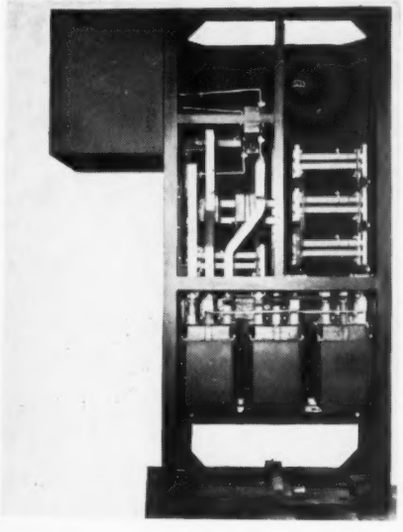
Mounted one above the other in the unit are three internal vained units through which air, gas or steam must travel in succession before it can issue at the connection. Each of these units sets up a rapid, whirling movement in the element as long as there is passage through the separator. This whirling throws moisture and dirt outward from the center. At the same time the flow is caught by additional sets of vanes curved in the opposite direction and secured to overlapping sleeves inside the housing. The reversal following the centrifugal action causes the moisture and dirt to strike the inner surface of the cups from where they drop to a collection chamber inside the shell of the assembly.

Separator is suitable for pipe sizes up to ¾-inch. It is made with a tie-rod assembly of heads and shell so inside is accessible for examination. Metals used throughout are rustproof and acid resisting.

Motors Controlled By Breaker Setup

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced a three-breaker combination for motor control containing forward, reverse and braking oil circuit breakers.

Each breaker is electrically operated with an independent mechanism. The forward and reverse breakers are arranged to close their contacts when the solenoid is energized, while braking breaker contacts are opened when this is accomplished. This is done by a mechanical cross trip from either one of the other two breakers.



All three breakers are both electrically and mechanically interlocked so neither the forward nor reverse breaker can be closed unless the brake contacts are open.

Breakers are of the 25,000-kilovolt ampere type with rupturing capacity of 7500 volts, 600 amperes. They are equipped with silver to silver contacts, De-ion interrupters and Micarta bushings all of which are enclosed.

Equalizing Mechanism Features Drop Hammer

■ Pneumatic Drop Hammer Co., Boston, has placed on the market a pneumatic double-lift gravity drop hammer for forming and stamping sheet metal parts such as are required by aircraft industries and those manufacturing hollow ware.

A distinct innovation of the hammer is the independent self-acting equalizing mechanism which automatically adjusts the head to a parallel and evenly balanced position neutralizing any condition of off-center loading, striking or uneven lifting. The anvil is a solid casting which supports the two rigidly attached uprights which are tied together at the top by a yoke mem-

ber which in turn supports a portion of the self-acting equalizing mechanism and the lifting speed arresting cylinders. It is also fitted with a renewable steel bolster plate doweled and keyed into place, bolster plate being machined with slightly tapered holes spaced to accommodate a wide range of dies.

Drop head of steel casting is elevated by two lifting cylinders, one on each side of the anvil. These are also removable. Face of the head is drilled for die holding bolts arranged for making soft metal forcers by pouring molten metal through conical openings located in the drop head, after the drop head with holding bolts has been lowered into position on the stops and dam surrounding the bottom die. The drop head also is fitted with a dovetail opening for holding steel or other solid metal forcers or special tool holding devices.

The size of the machine is 24 x 24 inches with an anvil of 44 x 40 inches. Approximate weight of the unit is 18,000 pounds and the distance between uprights 26½ inches with a maximum die space of 24 x 24 inches. Lifting capacity of cylinders with air at 80 pounds pressure per square inch is approximately 2200 pounds as a maximum figure.

Gear Tester Checks Component Elements

■ Carl Zeiss Inc., 485 Fifth avenue, New York, has announced an improved model of a gear testing machine that furnishes an accurate analysis of individual gear errors by checking component elements, rather than by showing only the sum total of all errors.

This is accomplished by checking the base circle pitch, tooth thickness, and concentricity. The instrument has been made extremely rigid, assuring readings to an accuracy of 0.00005 inches with perfect repeating. As indicators, two orthotest feeler gages have been built in. Capacity of the supporting frame is for gears up to 16 inches in diameter. Above that size, the measuring slides may be used separately. Gears of all kinds including Fellows' cutters are handled by this instrument.

Process Timer Has Ninety-Six Signal Stops

■ Zenith Electrical Co., 607 Dearborn street, Chicago, has introduced a synchronous program clock and process timer which can be built for a variety of processes and has ninety-six signal periods during each 24 hours.

The timer comes in four types to fit various requirements. The standard model has one 24-hour dial and a 1-hour dial cam with two pointers connected with an electrical contact arm on each dial.

Segments are cut in the 24-hour dial at the periods signal is to operate. The 1-hour dial cam has slots at each 15 minute period. When in use, at each 15 minute period one pointer drops into a slot on the 1-hour dial, but cannot make a contact until the preset time is reached on both dials. Then both pointers drop at the same moment, resulting in a contact with ringing of the signal for a predetermined period.

Drill Has Hard Tip

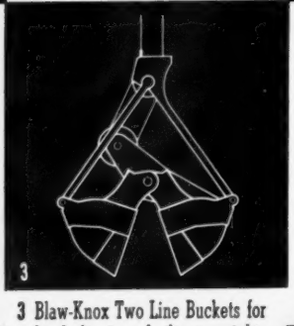
■ Willey's Carbide Tool Co., 1340 W. Vernor highway, Detroit, has developed a carbide-tipped drill intended to facilitate the drilling of anchor holes in non-metallic materials such as concrete, tile, slate, plaster, limestone and asphalt.

One of the important advantages of this drill is its extreme tip hardness; yet it can be sharpened on any type stand grinder. It can be operated in a portable electric drill, hand brace or drill press, at any speed, without cooling agent.

THERE'S A
BLAW-KNOX
BUCKET
FOR EVERY STEEL
PLANT SERVICE

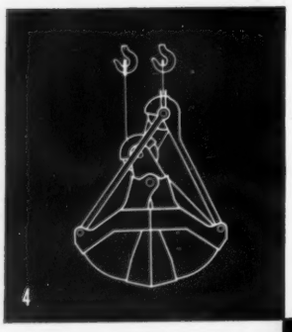
1 Granulated B. F. Slag, comparatively easy digging, permitting use of Blaw-Knox POWER WHEEL BUCKETS with large, hardened, slow-moving bearings—principally a maintenance problem.

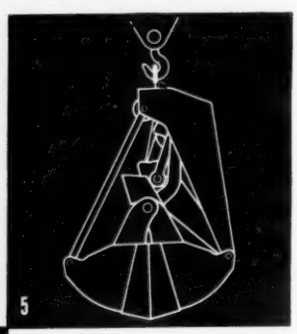
2 Blaw-Knox ORE BUCKETS four-rope type, low height for high storage, anti-friction sheave bearings—exceptional digging qualities developing 1 to 1 ratio or better.


3 Blaw-Knox Two Line Buckets for hard digging; built at weights suitable for handling O. H. slag, limestone, Spiegel, Ferro Mang., pig iron. Adaptable to overhead cranes and locomotive cranes.

●

6 Blaw-Knox Two Line Buckets for locomotive cranes built at various weights to suit operating requirements including medium weight types adaptable to broad range of service.


4 When "hook-on" operation is necessary, much is gained by using Blaw-Knox 2 line type hook-on buckets. Especially suited to O. H. cinder yard service where 2 hooks are usually available.


5 Blaw-Knox Single Line "Hook-On" Buckets. Heavily built for O. H. service and medium weight types for handling roll scale, also for handling clay and other materials in O. H. Ladle House.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2002 FARMERS BANK BUILDING • PITTSBURGH, PA.

All on One Floor

(*Concluded from Page* 40)

fications tests and inspection. These four tanks are arranged in two parallel rows, each tank equipped with hydraulic hoist so that reels of wire or cable may be lowered to required depths and raised to floor level after test time has expired.

Wood Construction

Storage compartments are constructed of wood and are located immediately adjacent to the shipping department. Stocks of finished products are segregated according to specifications, each storage area is labeled to facilitate location of individual items of stock. Skids and lift trucks are utilized to facilitate speedy loading of outgoing stock and eliminate hand lifting.

While the entire manufacturing operations are on the single floor, company offices and laboratory occupy a two-story unit at the front of the plant. All executive offices, conference rooms and laboratory are air conditioned and soundproofed. Incidentally air-conditioning ducts also are provided in the shipping department. The company's former laboratory was confined to a small space in a single office in the original building; in the new plant from 65 to 70 per cent of the office building is devoted to this research work.

Electroplaters Solve Shop Problems with Research

(*Concluded from Page* 37)

practically as much as heavier gage ones, and have shorter life. Corrosive fumes require corrosion-resistant metals. With the use of an induced draft system, corrosive fumes can be exhausted without passing them through the fan. Mr. Smith stated that hoods should not be left open at points where no work enters; hinged doors should be provided to permit easy access.

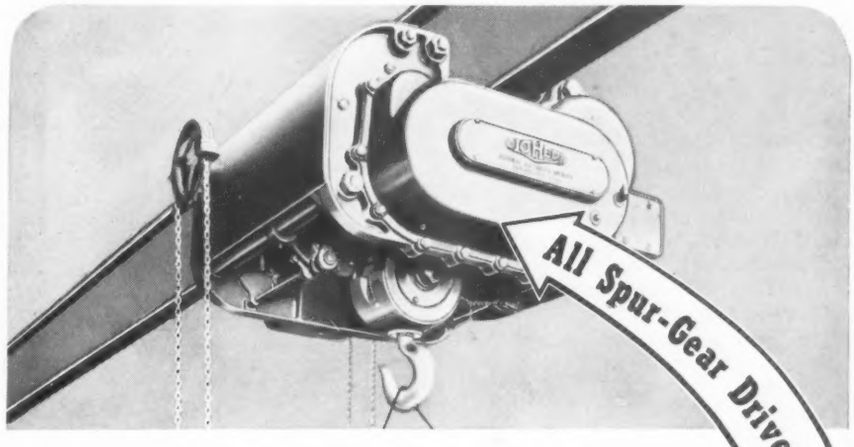
Method Outlined

A practical method for maintaining the solution in plating baths, as developed by the Philadelphia branch, was outlined by Frederick Fulforth, Proctor Electric Co., Philadelphia. The method involves computing unit quantities of various chemicals required by formulas, usually given in ounces per gallon, for individual plating tanks or per 100 gallons; recording this data and making use of it instead of refiguring each time replenishment becomes necessary. Factors similarly developed for molecular weights of various ingredients also facilitate computation of replacement requirements. Mr. Fulforth pointed out that with the use of such data, the work of maintaining baths can be handled by a nontechnical man, and in all cases, computations are less complicated.

Spotty appearance of bright dip work is caused by the dip being too hot, explained George C. Muscio, chemist, Lea Mfg. Co., Waterburg, Conn., who reported the results of an investigation conducted by the Waterbury branch. When large quantities of work are to be dipped, the speaker recommended alternate use of two baths, so that the baths might have ample time to cool. In dips for matte finish, extreme care must be taken to prevent water from entering the preliminary dip.

General Electric Forms Standards Department

■ Better co-ordination in developing and applying standards, both within and without the company, is the aim of a new standards department established by General Electric Co., Schenectady, N. Y. The department will work with the various local, national and international agencies interested in standards and codes and also will promote development of standards for use in the company's engineering and manufacturing departments.



Investigate THE hoist that costs the least to operate. Let the nearest A-E-CO representative* tell you why the all spur-gear drive of A-E-CO Lo-Hed Hoist reduces power consumption.

Ask him to explain Lo-Hed's exclusive features that mean constant, dependable performance and lower maintenance cost.

Let him show you Lo-Hed's uses in scores of industries. Find out *why* Lo-Hed is the logical hoist for EVERY purpose and why it is the *only* hoist for low headroom conditions. A-E-CO Lo-Hed Hoists are built in many standard models, from ¼ to 12 ton capacities.

Lowers Cost of Operation Here

*Classified phone directories list the local A-E-CO representative in principal cities. Call him in . . . or write us for the new hoist catalog.

Other A-E-CO Products: Taylor Stoker Units Marine Deck Auxiliaries Hele-Shaw Fluid Power.

A-E-CO Lo-Hed HOISTS

AMERICAN ENGINEERING COMPANY

2484 ARAMINGO AVENUE, PHILADELPHIA, PA.

Mass Charging

(*Concluded from Page* 38)

empty pan is removed from the cradle and again filled with cold metal.

In charging a furnace, the front of the furnace is removed when the charging machine is opposite the furnace. The cradle and loaded pan then are run into the furnace the full distance. Retraction is immediately commenced and, while being retracted, the pan floor is caused to roll underneath the pan frame thus depositing the charge uniformly upon the furnace hearth. The rear wall of the pan is held stationary. After the entire charge has been deposited progressively on the hearth in a layer approximately uniform in thickness, and while the platform and cradle are still being retracted, the pan floor is rolled back onto the upper side of the pan frame.

When the cycle of operations has been completed, the empty pan is transferred to the hoisting mechanism, lowered onto the transfer car and refilled for charging another furnace.

This system eliminates the use of machines equipped with a charging ram for engaging, one at a time, small charging boxes which must be inserted, turned over to dump and removed. It also eliminates expense of cutting scrap to small charging box size or to a size dictated by furnace door dimensions. Since entire charge is deposited at one time, furnace doors are opened only once, thus reducing heat losses caused by repeated opening of furnace doors. Charging in this manner is accomplished with much less power consumed in handling the material.

Reduces Time Per Heat

The rapidity with which it is possible to charge completely the largest furnace by this new method greatly reduces the time per heat, resulting in a corresponding increase in tonnage output per furnace.

Steps involved in charging by this method are shown graphically in the four diagrams on page 38. Top view represents charge deposited in pan of charging machine and furnace ready to receive charge. In the second view, the furnace door has been opened and the charging machine with the load of cold metal inserted in the open door. Third diagram shows charge being deposited as the charging machine retracts from the furnace, the bed of the charging machine being rolled continuously underneath the frame to dump the charge in a uniform layer on the furnace hearth. As charging machine completes dumping, it rolls the pan back on the upper surface. As it continues to retract, it finally assumes its original position.

Since entire sequence of operations requires little time, charging can be done at an extremely fast rate. All operations follow continuously in rapid succession. By providing a number of hoists and charging pans, one charging machine can serve a large number of furnaces.

♦

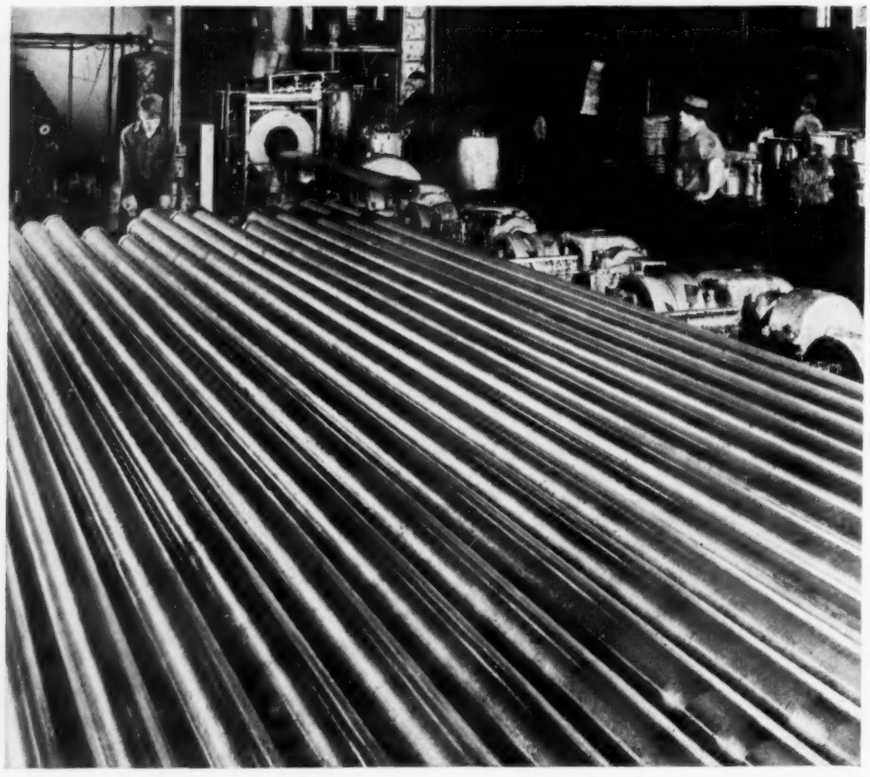
Gas Immersion Heating

(*Concluded from Page* 36)

that the pipe itself never approaches the melting temperature of lead. Since the heat transfer through lead is less than through wrought iron and copper the gas consumption will run somewhat higher for the same length of coil, as indicated by high flue temperatures. However, the efficiency with lead coils can be bettered by increasing their length.

On a tinning operation in a sheet mill, steel sheet was first covered with an acid flux and then molten tin was poured over it. The excess tin dripped back into the melting pot so that the bath in turn accumulated considerable acid. However, the pot was successfully heated with gas fired immersion elements of cast iron seemingly with no deleterious effects.

Automatic Spraying



■ **This equipment is applying a coat of aluminum paint to large size steel pipe using automatic spraying equipment seen at upper center. Power driven rolls at upper right carry pipe through spray chamber. Photo courtesy Aluminum Co. of America**

Foundry Sand Tests In Fourth Edition

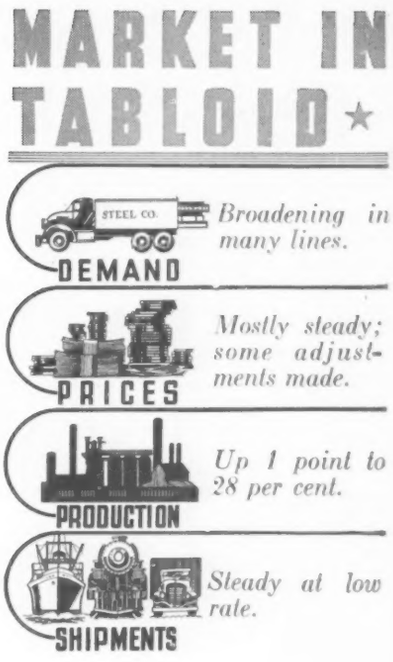
■ *Testing and Grading Foundry Sands and Clays,* by American Foundrymen's association, fourth edition; supplied by STEEL, Cleveland, for $4; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The third edition was issued in 1931 and this is the first revision since that time. It represents the work of the committee on standard tests of the American Foundrymen's association foundry sand research committee.

The new edition is enlarged and contains many new tests for sands and clays. It contains 16 standards and 17 tentative standards and one recommended method. It contains an extensive table of contents and a cross index of materials. It is bound in a flexible cover processed to resist dirt and withstand rough handling in the shop or laboratory.

Lower Price Schedule By Carnegie-Illinois

Scrap Up Sharply; Buying Broadens; Exports Decline



■ ANNOUNCEMENT by Carnegie-Illinois Steel Corp. Friday of reductions in finished and semifinished steel products, ranging from $3 to $5 per ton, effective immediately, puts the market on approximately the same level as that prevailing before 1928. Additionally the differential between Pittsburgh and Chicago is wiped out and the same quotations apply f.o.b. mill at both points. The change in this respect is stated to be a consequence of increased production facilities and greater diversification of products in the Chicago district. Schedule of the new prices will be found on page 17.

Clarification of the price situation by this announcement removes remaining doubts of the stability of prices and buyers who have been hesitant may be expected to enter the market with confidence. It seems entirely likely other producers will follow the reduced schedule.

Better conditions of demand have been noted in the market for some time past, signalized by slightly higher production rates and strength in scrap.

Observers who believe the scrap market a good indicator note a rise of $1.50 per ton at Pittsburgh, the leading consuming center, and 50 cents to $1 per ton in the East and West. Buying by steel mills is being reflected immediately in higher prices and discovery that scrap accumulations are not large and holders are averse to selling too quickly. Further advances are forecast for the immediate future. A purchase of 20,000 tons by a Valley interest set a higher price than had prevailed.

For the most part there is no question of prices, which are firm except in one or two highly competitive lines. Recent reduction in galvanized sheets has been followed by drum stock sheets being marked down $3 by a number of makers and reinforcing bars have been reduced $5 per ton by most mills. Both these changes have been to meet competition which has established a lower level than that quoted by many makers.

An increase of 1 point to 28 per cent in the national steel operating rate last week resulted from increased activity at important centers, somewhat balanced by curtailed rates at some other points. Pittsburgh gained 0.7-point to 24 per cent, Chicago 2.5 points to 24.5, Eastern Pennsylvania 1 point to 27, Youngstown 5 points to 32, Wheeling 3 points to 38 and Detroit 8 points to 29 per cent. Buffalo held unchanged to 28 per cent. St. Louis declined 2.7 points to 36.6 per cent, Cincinnati 14 points to 14 per cent, New England 10 points to 15 per cent, Birmingham 16 points to 42 per cent and Cleveland 8 points to 23 cent.

Automobile production dipped slightly last week with 40,918 units, compared with 41,790 the preceding week and 121,032 in the corresponding week last year. General Motors turned out 16,950, compared with 18,175; Chrysler 6095, compared with 6195; Ford 13,810, compared with 11,810; independents produced 4063, compared with 5610 the previous week.

Steel exports in May were 166,319 tons, excluding scrap, 7 per cent lower than in April and practically 50 per cent less than in May, 1937. Scrap shipments at 374,320 tons represented the peak monthly shipments in this industry. Japan led in tonnage, with Canada second. For five months total exports, excluding scrap, were 967,411 tons, compared with 1,063,678 tons in the corresponding months of 1937. Scrap shipments in five months this year were 1,636,247 tons, compared with 1,652,363 tons in five months of last year.

Because of strength in scrap quotations at all consuming centers the composite price of steelmaking grades advanced 83 cents to $11.46. This is the highest level since the latter part of April and the first rise of importance since the closing weeks of January, practically five months. Influence of scrap components of the iron and steel composite brought an increase of 13 cents to $38.51, the highest since mid-January. The finished steel composite is unchanged at $61.40.

COMPOSITE MARKET AVERAGES

	June 25	June 18	June 11	One Month Ago May, 1938	Three Months Ago March, 1938	One Year Ago June, 1937	Five Years Ago June, 1933
Iron and Steel	$38.51	$38.38	$38.38	$38.50	$38.80	$39.82	$28.71
Finished Steel	61.40	61.40	61.70	61.70	61.70	61.70	45.30
Steelworks Scrap..	11.46	10.63	10.71	11.47	13.20	17.15	9.55

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	June 25, 1938	May 1938	March 1938	June 1937
Steel bars, Pittsburgh	2.25c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.25	2.50	2.50	2.50
Steel bars, Philadelphia	2.57	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.10	2.25	2.25	2.25
Shapes, Philadelphia	2.315	2.465	2.465	2.455
Shapes, Chicago	2.10	2.30	2.30	2.30
Tank plates, Pittsburgh	2.10	2.25	2.25	2.25
Tank plates, Philadelphia	2.295	2.445	2.445	2.435
Tank plates, Chicago	2.10	2.30	2.30	2.30
Sheets, hot rolled, Pitts.	2.10	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.65	3.80	3.80	3.80
Sheets, hot rolled, Chicago	2.15	2.50	2.50	2.50
Sheets, No. 24, galv., Gary	3.75	3.90	3.90	3.90
Bright bess., basic wire, Pitts.	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	37.00	37.00	37.00
Rerolling billets, Pittsburgh	34.00	37.00	37.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	June 25, 1938	May 1938	March 1938	June 1937
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del., Philadelphia	25.34	25.34	25.34	25.26
No. 2 foundry, Pittsburgh	25.21	25.21	25.21	25.21
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	26.215	26.215	26.215	26.135
Malleable Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.77	107.49	107.29

Scrap

Heavy melting steel, Pittsburgh	$12.75	$11.55	$13.65	$18.40
Heavy melt. steel, No. 2, E. Pa.	10.25	10.00	12.75	15.25
Heavy melting steel, Chicago	10.75	11.05	12.20	16.00
Rails for rolling, Chicago	15.50	14.85	15.25	19.50
Railroad steel specialties, Chicago	14.25	13.60	14.25	19.50

Coke

Connellsville, furnace, ovens	$3.75	$4.25	$4.25	$4.65
Connellsville, foundry, ovens	5.00	5.25	5.25	5.30
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.10c
Gary	2.10c
Chicago, delivered	2.13c
Detroit, del.	2.30c
New York, del.	2.46c
Philadelphia, del.	2.42c
St. Louis, del.	2.33c
Granite City, Ill.	2.30c
Pac. base pts. f.o.b. cars, dock	2.65c

Galvanized No. 24

Pittsburgh	3.65c
Gary	3.75c
Chicago, delivered	3.78c
Philadelphia, del.	3.97c
New York, delivered	4.01c
Birmingham	3.80c
St. Louis, del.	3.88c
Granite City, Ill.	3.85c
Pac. base pts. f.o.b. cars, dock	4.25c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.20c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars, dock,	3.60c

Long Ternes No. 24 Unassorted

Pittsburgh	4.10c
Gary	4.20c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.90c	3.50c
Gary	3.00c	3.60c
Granite City, Ill.	3.10c	3.70c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.40c
Philadelphia, del.	2.29½c
Boston, delivered	2.53c
Buffalo, delivered	2.34½c
Chicago or Gary	2.10c
Cleveland, del.	2.30½c
Birmingham	2.10c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
St. Louis, delivered	2.39c
Gulf ports	2.50c
Pacific basing points, f.o.b. cars, dock	2.65c
Do. floor plates	4.05c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Mfg. terne plate, Pittsburgh	4.65c
Gary	4.75c
Granite City	4.85c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.31½c
New York, del.	2.37c
Boston, delivered	2.51c
Bethlehem	2.35c
Chicago	2.10c
Cleveland, del.	2.31c
Buffalo, delivered	2.37½c
Gulf ports	2.50c
Birmingham	2.10c
St. Louis, del.	2.39c
Pacific coast basing pts., f.o.b. cars dock,	2.65c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.40c
Birmingham	2.25c
Cleveland	2.30c
Buffalo	2.55c
Detroit, delivered	2.40c
Philadelphia, del.	2.67c
Boston, delivered	2.69c
New York, del.	2.61c
Gulf ports	2.65c
Pacific coast basing pts., f.o.b. cars, dock	2.80c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Detroit, delivered	2.45c
Cleveland	2.35c
Moline, Ill.	2.35c

Buffalo, delivered	2.37½c
Birmingham	2.45c
Gulf ports	2.70c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.67c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.05c
Gulf ports	2.65c
Pacific coast ports, f.o.b. car docks	2.75c
Philadelphia, del.	2.57c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Buffalo, Cleveland, Birm., Young.	2.10c
Gulf ports	2.50c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	$74.00
Single loop bale ties, (base C. L. column)	$63.00

To Mfg. Trade, base Pitts.-Cleve.

Bright bess., basic wire	2.90c
Galvanized wire	2.95c
Spring wire	3.50c

On above wire items, Anderson, Ind. (merchant products only) and Chicago prices 5 cents per 100 lbs. higher; Duluth (except spring wire) and Worcester up 10 cents, Birmingham (except spring wire) up 15 cents; Pacific coast up 45 cents.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100	0.15 to 0.25 Mo.		0.55
4600	0.20 to 0.30 Mo. 1.50-2.00 Ni.		1.10
5100	0.80-1.10 Cr.		0.45
5100	Cr. spring flats		0.15
6100	bars		1.20
6100	spring flats		0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200	spring flats		0.15
9200	spring rounds, squares		0.40

Electric furnace up 50 cents.

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c
Gulf and Pac. coast ports	3.05c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23/16-in. Pittsburgh	2.15c
Chicago or Gary	2.15c
Birmingham base	2.15c
Detroit, del.	2.45c
Philadelphia, del.	2.58c
New York, del.	2.61c
Cooperage hoop, Pittsburgh	2.40c
Chicago	2.50c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.10c
Detroit, del.	3.41c
Worcester, Mass.	3.30c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.10c	3.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Commodity	Cold-Rolled Strip
Pitts.-Cleve.	3.25c
Worcester	3.65c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, mills	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Car axles forged, Pitts., Chgo., B'ham.	3.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and larger	60-5 off
Tire bolts	50 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

Semifinished hex.; ½-in. and smaller	60-10 off
Do., ⅞ to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	70-5 off

Square Head Set Screws

Upset, 1-in., smaller	80-5 off
Headless set screws	75 off

Rivets, Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
11 and 12	59½	49

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch lap weld	59½
12-inch, lap weld	58½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.89	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.80-58.80
6 to 24-in., Chicago	54.80-55.80
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.83
Duluth	39.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleveland, No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/32-in. incl.	52.00

Chicago, Anderson, Youngstown, up $1; Worcester up $2; Birmingham up $3; Galveston up $6; Pacific coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.65

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., del. Pittsburgh 107.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 106.50
2% carbon 111.50 1%, 121.50
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.70-1.75

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrotitanium, c. l., prod-plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, f.o.b. Niagara Falls, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.80
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, f.o.b. Niagara Falls, ton $74.00
Do, spot 79.00
Less-ton lots, lb. 4.25c

Manganese Briquets, contract carloads, f.o.b. Niagara Falls, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Struc-tural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.00
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.50	4.75
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.18	4.18	3.88	3.88	5.48	3.93	4.68	5.33
Detroit	3.94	4.19	4.19	3.98	3.98	5.58	3.94	4.69	5.43
Cincinnati	4.08	4.28	4.28	3.98	3.98	5.58	4.03	4.78	5.43
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.40	4.65	4.65	4.30	4.30	5.90	4.10	4.85	5.50
Memphis	4.36	4.56	4.56	4.26	4.26	5.91	4.31	5.06	5.71
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	6.03	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.70	6.50	4.05	4.05	5.55	4.20	5.15	5.40

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.76	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.81	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.91	4.56	4.28	7.81	6.36	6.11	9.01	....	....
Baltimore	....	4.55	4.15	...	....	.. .	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.72	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	...	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.80	6.35	6.35	8.20	8.60	7.15
Detroit	3.80	4.30	4.09	7.92	6.47	6.22	7.74	8.90	7.45
Cincinnati	....	4.53	4.10	7.94	6.49	6.24	9.34	8.95	7.50
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.46	4.85	....	....	....	....	....	... .	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.98	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	..	.	.	..	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, June 23

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental North Sea ports, gross tons Quoted in dollars at current value	Channel or **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.28 5 10 0	$15.77	1 19 0
Basic bessemer	.....	17.99	2 4 6
Hematite, Phos. .03-.05	32.24 6 10 0*	.....	.....
Billets	$39.06 7 17 6	$43.46	5 7 6
Wire rods, No. 5 gage	55.92 11 5 6	41.43	5 2 6
Standard rails	$55.18 10 2 6	$44.28	5 15 0
Merchant bars	2.44c 11 0 0	1.93c	5 5 0
Structural shapes	2.36c 10 12 6	1.78c	4 17 6
Plates, †¾ in. or 5 mm.	2.57c 11 11 3	2.24c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.89c 13 0 0	2.61c	7 2 6°
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.16c	8 12 6
Bands and strips	2.94c 13 5 0	2.01c	5 10 0
Plain wire, base	4.33c 19 10 0	2.24c to 2.66c	6 2 6 to 7 5 0
Galvanized wire, base	5.16c 23 5 0	2.87c to 2.97c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.56c to 2.74c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.03 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$27.03 5 9 0(a)	$16.56	598	$16.10	475	$25.40 63
Basic bess. pig iron	24.80 5 0 0(a)	.....	...	....	...	28.02 (b) 69.50
Furnace coke	7.44 1 10 0	5.68	205	7.29	215	7.66 19
Billets	39.06 7 17 6	23.27	840	29.15	860	38.91 96.50
Standard rails	2.25c 10 2 6	1.50c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.71c 12 4 0††	1.40c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.45c 11 0 6††	1.37c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.60c 11 14 3††	1.76c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.50c 15 15 0§	1.30c	1,000‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.11c 18 10 0	2.93c	2,250	4.43c	2,950	6.66c 370
Plain wire	4.33c 19 10 0	2.16c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.87c 12 19 0††	1.57c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 65.74 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Bos. dock No. 1 exp.	9.00- 9.50
New Eng. del. No. 1	9.50
Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.50-11.00
Chicago, auto, no alloy	9.00- 9.50
Chicago, No. 2 auto	8.00- 8.50
Cincinnati, dealers	7.75- 8.25
Cleveland, No. 1	10.50-11.00
Cleveland, No. 2	9.50-10.00
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1	12.00-12.50
Eastern Pa., No. 2	10.00-10.50
Federal, Ill.	9.75-10.25
Granite City, R. R.	10.00-10.50
Granite City, No. 2	9.00- 9.50
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
New York, No. 1	†9.00
N. Y. dock No. 1 exp.	10.00
Pitts., No. 1 (R. R.)	12.50-13.00
Pittsburgh, No. 1	12.50-13.00
Pittsburgh, No. 2	11.00-11.50
St. Louis, R. R.	10.00-10.50
St. Louis, No. 2	9.00- 9.50
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dlrs. No. 1	9.00
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo	8.50- 9.00
Chicago, factory	9.50-10.00
Chicago, dealer	8.00- 8.50
Cleveland	10.00-10.50
Detroit	7.25- 7.75
E. Pa., new mat.	12.00-12.50
E. Pa., old mat.	8.50- 9.00
Los Angeles	12.50-13.00
Pittsburgh	12.00-12.50
St. Louis	5.50- 6.00
Valleys	11.50-12.00
Cincinnati, del	7.25- 7.75

BUNDLED SHEETS

Buffalo, new	8.50- 9.00
Buffalo, old	7.50- 8.00
Cleveland	6.50- 7.00
Los Angeles	11.00-11.50
Pittsburgh	11.00-11.50
St. Louis	4.75- 5.25
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	5.25- 5.75
Cincinnati, dealers	3.25- 3.75
Detroit	4.75- 5.25
*Los Angeles	3.75- 4.00
St. Louis	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.50- 9.00
Cincin., No. 1, deal.	6.25- 6.75
Cincinnati, No. 2	2.00- 2.50
Cleveland, No. 2	5.75- 6.25
Detroit, No. 1, new	6.25- 6.75
Valleys, new, No. 1	10.00-10.50
Toronto, dealers	6.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	2.25- 2.75
Cleveland	4.50- 5.00
Detroit	3.25- 3.75
Eastern Pa.	6.50- 7.00
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	6.75- 7.25
St. Louis	1.50- 2.00
Toronto, dealers	6.00
Valleys	7.00- 7.50

SHOVELING TURNINGS

Buffalo	6.00- 6.50
Cleveland	5.00- 5.50
Chicago	6.00- 6.50
Detroit	4.00- 4.50
Pittsburgh	6.75- 7.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	4.50- 5.00
Cincinnati, dealers	1.75- 2.25
Cleveland	5.75- 6.25
Eastern Pa.	6.00- 6.50
Detroit	3.75- 4.25
New York	†2.00- 2.50
Pittsburgh	6.00- 6.50
Toronto, dealers	6.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.00- 9.50
Chicago, elec. fur.	9.00- 9.50
Eastern Pa.	9.50 10.00
St. Louis	8.00- 8.50
Toronto	7.00

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†5.00
Bos. dist. for mills	†6.00
Buffalo	4.00- 4.50
Chicago	5.00- 5.50
Cincinnati, dealers	1.75- 2.25
Cleveland	5.75- 6.25
Detroit	3.75- 4.25
E. Pa., chemical	9.50-10.50
New York	†3.00- 3.50
St. Louis	1.50- 2.00
Toronto, dealers	6.50

RAILROAD SPECIALTIES

Chicago	14.00-14.50

ANGLE BARS—STEEL

Chicago	12.50-13.00
St. Louis	10.00-10.50

SPRINGS

Buffalo	14.00-14.50
Chicago, coil	14.00-14.50
Chicago, leaf	13.50-14.00
Eastern Pa.	15.50-16.00
Pittsburgh	15.00-15.50
St. Louis	12.75-13.25

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	15.50-16.00
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.00-13.50
Cincinnati, dealers	15.00-15.75
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	15.00-15.50
St. Louis, 2 ft. & less	13.00-13.50

STEEL RAILS, SCRAP

Boston district	†9.00
Buffalo	12.50-13.00
Chicago	10.50-11.00
Cleveland	14.00-14.50
Pittsburgh	14.00-14.50
St. Louis	10.50-11.00
Seattle	16.00

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis, cut	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	11.00-11.50

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.00- 8.50
Chicago, net	7.00- 7.50
Cincinnati, dealers	5.25- 5.75
Eastern Pa.	11.00-11.50
New York	†6.50- 7.00
St. Louis	7.00- 7.50

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	8.00- 8.50
Eastern Pa., No. 1	13.50-14.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	9.50-10.00
Toronto, No. 1 dlr.	15.00

FORGE FLASHINGS

Boston district	†4.00
Buffalo	8.50- 9.00
Cleveland	8.50- 9.00
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	10.50-11.00

FORGE SCRAP

Boston district	†4.00
Chicago, heavy	14.00-14.50

LOW PHOSPHORUS

Buffalo, crops	14.50-15.00
Cleveland, crops	15.50-16.00
Eastern Pa., crops	16.00-16.50
Pittsburgh, crops	15.50-16.00

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	13.50-14.00
Eastern Pa.	16.00-16.50
Pitts. (light & hvy.)	13.50-14.00
Seattle	15.00

RAILS FOR ROLLING

3 feet and over

Birmingham	16.00-17.00
Boston	†9.50
Chicago	15.25-15.75
New York	†13.50-14.00
Eastern Pa.	16.00-16.50
St. Louis	13.25-13.75

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	15.50-16.00
Boston district	†14.00
Chicago, net	15.50-16.00
Eastern Pa.	21.50-22.50
St. Louis	15.00-15.50

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.00-12.50

SHAFTING

Boston district	†13.25-13.50
New York	†14.00-14.50
Eastern Pa.	18.50-19.00
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†8.25
Buffalo, steel	14.00-14.50
Chicago, iron	11.50-12.00
Chicago, rolled steel	14.00-14.50
Cincin., iron, deal.	12.00-12.50
Eastern Pa., iron	14.50-15.00
Eastern Pa., steel	15.50-16.00
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	10.00-10.50
St. Louis, steel	12.75-13.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†10.00
N. Eng. del. No. 2	9.50-10.00
N. Eng. del. textile	11.50-12.00
Buffalo, cupola	12.50-13.00
Buffalo, mach.	13.50-14.00
Chicago, agri. net	9.00- 9.50
Chicago, auto	9.50-10.00
Chicago, railr'd net	9.50-10.00
Chicago, mach. net	10.00-10.50
Cincin., mach. deal.	9.75-10.25
Cleveland, mach. net	13.50-14.00
Eastern Pa., cupola	14.50-15.00
E. Pa., mixed yard	12.00-12.50
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	9.50-10.00
St. L., No. 1, mach.	12.00-12.50
St. Louis, agr. mach.	11.25-11.75
Toronto, No. 1, mach., net	11.50

HEAVY CAST

Boston dist. break.	†8.00- 8.25
New England, del.	10.50-11.00
Buffalo, break.	10.00-10.50
Cleveland, break. net	12.50-13.50
Detroit, break.	9.00- 9.50
Detroit, auto net	11.00-11.50
Eastern Pa.	13.00-13.50
Los Ang., auto, net	13.00-13.50
New York, break.	†8.00- 8.50
Pittsburgh, break.	11.50-12.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†6.00- 6.50
Buffalo	10.50-11.00
Chicago, net	6.50- 7.00
Cincinnati, dealers	4.75- 5.25
Detroit, net	7.50- 8.00
Eastern Pa.	11.00-11.50
New York, fdry.	†7.25
St. Louis	6.75- 7.25
Toronto, dealers, net	8.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	13.00
Buffalo	12.00-12.50
Chicago, R. R.	11.50-12.00
Cincin., agri. deal.	9.00- 9.50
Cleveland, rail	11.50-12.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R.	14.00-14.50
Los Angeles	17.50-18.00
Pittsburgh, rail	13.00-13.50
St. Louis, R. R.	10.00-10.50

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton unit, duty pd.	nom.$18.00-19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	nom. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 64

Pittsburgh—Sheet orders reflecting a generally better feeling in the industry have increased somewhat and production figures are up slightly, although not to any marked degree. Common black and full finished sheet production approximates 30 per cent of capacity and the indication is for a generally slow upward trend over the next few weeks. The galvanized sheet situation is still unsettled, with prices weak and in many cases breaking under the currently quoted base of 3.65c, Pittsburgh. No intimation of further action on galvanized sheets has been forthcoming as yet. Galvanized production is quoted at 39 per cent of capacity.

Cleveland—Sellers of hot and cold-rolled sheets report a slight improvement in specifications recently, reflecting a mild pick-up in operations among a number of miscellaneous consumers. It is too early to predict that the current downward cycle has been reversed, although many sellers confidently feel that the summer months will not be as drab as formerly expected. To meet competition some producers have reduced the price on drum stock $3 a ton to 2.15c, Pittsburgh. Other sheet items remain firm.

Chicago — Demand has not improved but automotive requirements are expected to be up soon. The new galvanized sheet base price has not stimulated buying but although it is still early, producers are not inclined to believe the official quotations would result in increased demand for this item. Instances of price concessions are being reported on other sheets but this, too, has been without apparent effect.

Boston — Galvanized sheet prices are steadier and the element of uncertainty has been largely eliminated by the recent price announcements. Buying is less active, some buyers having covered at concessions earlier in the month. Blue annealed volume is steady with small tank builders placing some tonnage. Cold-finished is inactive.

New York—Some sheet sellers note irregular improvement as a result of increased small miscellaneous orders but buying generally continues light with the price situation uncertain, notably in galvanized. Some business undoubtedly is being done at the expense of prices and some shipments are held up as the result of hope of lower steel prices. Pressure is being exerted in the latter cases. Drum stock sheets have been reduced $3 per ton by several producers and some are reported to be allowing a drawback of $5 per ton on such stock going into drums for export. Stainless sheets are holding better than other grades.

Philadelphia—Miscellaneous buying of both hot and cold-rolled sheets shows some improvement. Several round lots have been placed in the past few days, including a substantial lot of galvanized sheets for a government job. Specifications for 1938 automobiles, which now are fairly well out of the way, were better than had been expected. The trade expects 1939 model releases within 60 days.

Buffalo — A minor gain in sheet orders is noted, but volume is still low. Inquiries for 1938 model requirements from the automotive industry are awaited. Mills continue to limit production to filling of orders on hand.

Cincinnati — Volume of sheet orders last week increased after a few days of decreased demand. Specifications from miscellaneous sources continue to sustain schedules while export and automotive needs are exceedingly light. Galvanized is moving better than the market average, near 30 per cent.

St. Louis—Demand for sheets continues light and scattered. Moderate betterment is noted in specifications on galvanized sheets and tin plate. Prospects look somewhat better for the latter material, due to the promising outlook for many regional vegetable crops, including tomatoes and beans. Reports from the South indicate expansion in demand for galvanized roofing, mainly for repairs and small residential building.

Late Prices on Page 17

Details of price announcement by Carnegie-Illinois Steel Corp. late Friday, involving finished and semi-finished steel products, effective immediately, reductions ranging from $3 to $5 per ton, will be found on page 17 of this issue of STEEL.

Strip

Strip Prices, Page 65

Pittsburgh — Both hot and cold-rolled strip production holds steady at about 20 per cent of capacity. Orders are all small and there is little indication that there will be any change in this picture in the near future. Absence of automotive buying continues a depressing factor.

Cleveland—Further slight gains in specifications for both wide and narrow hot and cold-rolled strip have been noted recently. The fact that users' stocks are scraping bottom is plainly illustrated in requests for immediate delivery on all tonnage recently placed. Sellers estimate tonnage placed during June will exceed that of May by a comfortable margin and some predict further gains through June and July contrary to the normal seasonal trend.

Boston — No improvement is noted in narrow cold strip demand, incoming tonnage from miscellaneous consumers barely maintaining rerolling operations. While orders are fairly numerous, releases are small and widely diversified as to specifications, with prompt delivery asked. As a result mill operations continue irregular. Consumers of hot strip are buying sparingly to fill gaps in inventories. While prices are steady as a rule some weakness is noted at times with secondary sellers.

New York — Demand for narrow cold strip is slightly improved, there being a wider call from miscellaneous consumers with some orders from the automobile industry trickling in. Most larger consumers, however, are buying fill-in lots only and finishing mill operations are generally maintained. Prices among some secondary sellers are shaded, but mill quotations are steady as a rule.

Philadelphia — Narrow strip demand has turned up slightly, in line with betterment of other products, though consumers still are inclined to buy only small lots. Prices are steady.

Birmingham, Ala. — The output of strip is practically at a standstill, and will remain so, probably, for several weeks because of the absence of cotton tie business.

Plates

Plate Prices, Page 64

Philadelphia — Plate buying has not expanded measurably although a fair volume is before the trade. The Pennsylvania railroad is floating an issue of $6,330,000 equipment trust certificates, June 29, to finance construction of 1000 gondolas, 20 electric locomotives, eight special freight cars and two experimental coaches. The Pennsylvania is examining its steel inventories at Altoona shops and will place its additional requirements soon. No new ship releases have been made but considerable tonnage is in sight. Sellers are figuring on a fair total of penstock, dredge and standpipe work. Some boilermakers are op-

erating at 40 to 45 per cent, but largely on light work.

Cleveland—Sellers note a moderate gain in inquiries recently, originating from miscellaneous sources. However, awards are still limited to small tonnages. June bookings should register a slight gain over May. Mill operations are unsteady. Prices are firm.

Chicago—Tank makers are ordering small tonnages from time to time in cases where stocks are insufficient for current needs, while demand from other sources is almost nonexistent. Platemaking schedules are spotty and further curtailment is expected.

Boston — Shipyard releases are steadier and some eastern mills are shipping more plates against orders, but aggregate volume from other sources is light. Large tank work is less active. Chicago Bridge & Iron Co., Chicago, booked a tank at Hallowell, Me., for the Colonial Beacon Oil Co., taking close to 100 tons. Boiler shops are doing little in most instances and buying accordingly. Few full car orders appear. Flanged and dished material moves slowly.

New York—Demand is dull and the outlook for the immediate future is unchanged except that the growing tonnage of hull and miscellaneous plates for shipbuilding is assured. Tank work in this district is light but bids are being taken on 32 to 56 tanks for Wright Field, Dayton, O. Flanged, dished and semi-fabricated material is slow and unchanged. Prices are inclined to weakness on some attractive business.

San Francisco — Bids which were to have been opened a week ago have just been taken by the United States engineer office, San Francisco, for two welded steel dump scows involving 480 tons of plates and 320 tons of shapes. To date this year 14,257 tons have been placed, compared with 27,742 tons for the same period a year ago.

Seattle—Bids have been received by Spokane, Wash., for 400 tons involved in 12,500 feet of 25-inch welded steel water pipe. More than 3000 tons of plates will be required for the 32 to 60-inch welded pipeline job at Vancouver, B. C., bids July 1. Shops in this area are short of work. Recent lettings have been less than 100-ton lots for tank and boiler jobs.

Plate Contracts Placed

Unstated tonnage, one 65½-foot steel diesel-driven tugboat, United States engineer, Philadelphia, to American Car & Foundry Co., New York, $51,831; bids May. 24.

Plate Contracts Pending

3000 tons, 32 to 60-inch welded water pipeline, Vancouver, B. C.; bids July 1.
1455 tons, bureau of supplies and accounts, navy department, delivery various yards, bids July 5; quotations to be taken same date on 700 tons of bars, various yards.
800 tons, including 320 tons of shapes, two welded steel dump scows, United States engineer office, San Francisco; bids opened.
400 tons, 25-inch welded water pipe line extension, Spokane, Wash; bids in.

Bars

Bar Prices, Page 64

Pittsburgh — Specifications for both alloy and common steel bars have been somewhat better but there has been no noticeable increase. A few spotty releases have been received from automobile makers on the final 1938 production and the 1939 orders have not begun to come in any volume, although there has been some activity on the part of one or two makers.

Cleveland — Consumers of commercial and alloy steel bars continue to buy only for actual needs and prompt delivery. Most inventories are said to be unusually low despite current restricted operations. Demand from farm equipment and road building concerns continue to ease slightly but this is regarded as seasonal. Despite the small volume of current business bookings for June are expected to show a slight improvement over May.

Chicago—Demand is poor and declining from week to week, with automotive interests in particular quieter. Increased movements are not in prospect as railroad demand is nearly dormant and farm equipment needs are tapering to what is expected to be an almost negligible point.

Boston—With most forging shops operating at curtailed schedules, demand for forging bars has declined again. Alloy bars are moving in small lots, but jobbers are buying more often. This is also true of commercial steel bars. Such orders are frequently made up of as many as eight items and specifications to make a full car. Machine and small tool shops are taking only what is needed to meet light operations and frequently buy from district distributors with available stocks.

New York—Buying is light and irregular, with large consuming industries buying only to fill assortments, although some jobbers are doing so more frequently. Alloy bars are moving steadily in small lots.

Philadelphia — Warehouses are placing slightly more tonnage to fill in assortments and activity in other directions shows some expansion. Heavy machinery builders are figuring more work although light equipment continues dull. With few exceptions bar stocks of consumers are low.

Buffalo — A pickup in merchant bar mill rollings will be noted in operations this week as one producer plans to operate three mills near capacity. Though orders are diversified, structural inquiries show a mild expansion.

Birmingham, Ala. — Buying of bars has been somewhat disappointing and particularly spotty due mainly to failure of business to develop from manufacturers of agricultural implements. Buying has barely held its own over the past few days.

Pipe

Pipe Prices, Page 65

Pittsburgh — Incoming orders for pipe and tubular goods have increased somewhat over the past week and the tone is noticeably better. The price situation remains fairly firm although some shading of prices has been noted in the secondary market. Oil country demand still is sustaining production, which is estimated at slightly less than 40 per cent of capacity.

Cleveland — Shipments of standard steel pipe from jobbers' stocks is little more than holding its own this month over May. Requirements from industrial sources for miscellaneous extensions and repairs have made some improvement, but buying for domestic purposes is at a minimum. Cast iron pipe foundries report conditions substantially unchanged although considerable tonnage is pending from small municipalities. Prices for both cast and steel pipe are firm.

Chicago — Poor demand continues and bookings are still small. WPA work dots the market for cast iron pipe and other minor tonnages serve to prevent complete quiet. Increased demand from newly financed government projects is not in immediate prospect.

Boston — The district foundry has booked approximately 425 tons of cast pipe for Chicopee and Quincy, Mass. Inquiry is fairly well maintained with Boston closing June 27 on 485 tons, to be bought through the procurement office, treasury department. The metropolitan district commission, Hartford, Conn., closes July 5 on 350 to 500 tons, taking bids on class C and class 150, the smaller tonnage

applying to the latter. Steel pipe buying is slow, but steady with resale prices reasonably steady.

New York — Purchase of close to 500 tons of cast pipe by a New Jersey utility from the Burlington, N. J., foundry is outstanding, few utility orders having been placed in recent months. Newark, N. J., procurement office, treasury department, has closed on about 600 tons, mostly 18-inch, with three foundries, the bulk going to United States Pipe & Foundry Co.

Resale steel pipe prices have steadied materially compared with several weeks ago, with demand light but steady for miscellaneous construction work.

Birmingham, Ala. — Pipe interests, on the curtailed schedule effective for several months, are awaiting developments in the field of public spending to give them the necessary momentum to carry on through the summer without further retrenchment.

San Francisco — Only four inquiries involving 100 tons or more of cast iron pipe are pending. Awards so far this year aggregate 14,334 tons as compared with 16,951 tons for the corresponding period in 1937.

Seattle—Demand shows no improvement and no large projects are up for immediate action. Spokane, Wash., will open bids June 30 for 22,000 feet of 6-inch cast iron pipe, about 125 tons. Sumner, Wash., has been allocated $64,889 WPA funds for proposed extension of water system headworks.

Cast Pipe Placed

300 tons,, 6 to 16-inch, Chicopee, Mass., to Warren Pipe Co., Everett, Mass.
125 tons, 4 to 12-inch, Quincy, Mass., to Warren Pipe Co., Everett, Mass.

Cast Pipe Pending

485 tons, 6 to 16-inch, class C, Boston; bids June 27, procurement office, treasury department, Boston.
350 tons, 6 to 16-inch, alternates on class C and class 150, metropolitan district commission, Hartford, Conn.; bids July 5.
166 tons, 6-inch, treasury department, invitation 5562, San Francisco; bids opened.
129 tons, 6-inch, treasury department, San Francisco; bids opened.
125 tons, 6-inch, for Spokane, Wash.; bids June 30.

Steel Pipe Pending

Unstated tonnage, 38 sections, 52 feet each, 32-inch i. d. steel pontoon pipe, United States engineer, Memphis, Tenn., pro. 306F; bids June 27.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Demand in the East is slightly heavier, notably from small structural shops with the outlook for shipbuilding requirements good. Production, while curtailed, is better than earlier in the quarter.

Wire

Wire Prices, Page 65

Pittsburgh — The nail market is quiet although somewhat improved, and the merchant wire trade has become more active. The manufacturers' wire division, which had been supplying most tonnage, has eased up somewhat and merchant wire now leads. Prices in some localities are weak, although the general picture remains fairly stable.

Cleveland — Sellers report mild improvement in tonnage booked this month over the comparable period during May. Due to gradual easing in requirements for merchant wire items from agricultural centers the current improvement has centered in manufacturers' wire. Mill operations continue unsteady, due to fluctuations of incoming orders. Mill prices are firm although the uneasy condition in secondary markets is reported causing some disturbance in certain sections.

Chicago—Counter to anticipation, an increase in demand has been felt by producers here. A rise in requirements for automotive accessories has appeared but is not expected to be of great duration. Farm needs are tapering noticeably but call for wire mesh is all that was anticipated, due, it is believed, to greatly increased use of this product in present road building programs, particularly in the south.

Boston — Some sellers of wire note slightly better demand from the automobile industry. While no large orders have been placed, even slight tonnage from that source is welcome in view of lack of demand for several months. Incoming volume, however, is slack, with tonnage unchanged in small miscellaneous lots. Demand for wire rods continues low and price weakness in nails continues with secondary sellers.

New York — Wire buying is a shade heavier, due in part to some business being placed by the automobile trade. While such volume is not large, resumption of purchasing by these consumers after weeks of inactivity, is encouraging. The improvement is especially noted in spring material. Flat wires are dull. Manufacturers' wire volume is maintained and in spots has registered slight gains. Heavier products are steady. Finishing departments in some instances are few points higher. Prompt delivery is specified on the slightly improved volume.

Birmingham, Ala. — Wire products, including nails and fencing, are maintaining the slight upturn noted two weeks ago, but bookings of spot business are somewhat below expectations.

Rails, Cars

Track Material Prices, Page 65

Entire lack of interest in steel by railroads is evident from absence of inquiry for rails or rolling stock. Inventory of steel at its Altoona, Pa. shops is being taken by the Pennsylvania in preparation for ordering its requirements for 1000 cars, 20 electric locomotives and several special cars.

No announcement has been made of approval or disapproval of the Southern railway's 5550 freight cars now before the interstate commerce commissioin.

United States Sugar Corp. has placed twenty 30-ton sugar cars and the Manila railway 50 thirty-ton cars.

Car Orders Placed

United States Sugar Corp., twenty 30-ton sugar cars to Magor Car Corp., New York.

Car Orders Pending

Manila railroad, fifty 30-ton box cars and fifty 30-ton flats.

Cold-Finished

Cold Finished Prices, Page 65

Pittsburgh — There has been a slight improvement in incoming business in cold-finished steel bars and a few automotive orders are being placed to balance up stocks for the remainder of 1938 production. Small tonnages of cold-finished steel bars have been placed for 1939 models by Buick, it has been reported. Other makers have shown no indication to place business as yet. Current orders hold production at around 20 to 25 per cent of capacity, which is about as low as it has been for some time. Jobbers are still in the market for small tonnages and characteristics of these orders indicate jobber inventories are as low as consumer inventories.

The price situation is generally strong, although there have been some isolated cases of shading on special products. Most sources indicate improved production by September, possibly up to 50 per cent of capacity.

Shapes

Structural Shape Prices, Page 64

New York — Structural contracts are down following purchase of close to 20,000 tons in the New York district recently. However, pending volume is on the up grade with 7000 tons for subway work in Brooklyn, closing July 8 with the board of transportation. Bids are in on approximately 1500 tons for schools. Two hangars, North Beach airport, New York, bid June 27, take 3000 tons. Fabricated structural steel prices are weak.

Pittsburgh — A fair amount of activity has been noted and feeling generally is improved. Several fair-sized projects have been announced and pending work includes a number of new jobs.

Cleveland — Structural steel market has registered little change recently, with awards from private sources limited to miscellaneous small tonnages. However, inquiries have shown a slight improvement although individual projects involved are of minor importance. Public work is more encouraging with bidding dates expected soon for the approaches for the Main street bridge, Cleveland, and for a number of other bridge projects such as the Cloverleaf development near Brecksville, O. Fabricated prices remain weak on both large and small projects.

Chicago — Inquiries are less recently. Massman Construction Co., Kansas City, Mo., was low bidder on the Pensacola dam work at Disney, Okla., which involves 3000 tons. Bids on 675 tons for Kansas City Terminal railway bridge over the Big Blue river will be read June 28. Crane building for export involves 700 tons.

Boston — Most active structural projects now pending involve small lots, several state bridges in Vermont and Massachusetts being included among new inquiries taking from 50 to 100 tons each. Awards are fewer, but include 250 tons for an industrial building addition, General Electric Co., West Lynn, Mass. This will be a welded job, the contract going to the Everett, Mass., structural shop.

Philadelphia — Eastern Pennsylvania area is providing less work for structural fabricators than some other sections, such as New York. Expenditure of $45,000,000 immediately by PWA will aid some but relatively little of it will be used for structural material. Plans are being prepared for a Catholic hospital for nuns, Philadelphia, costing $3,000,000, but steel will not be needed until fall. Fabricated prices continue weak.

San Francisco — Structural market was active and 3085 tons were placed, bringing the aggregate for the year to 53,223 tons compared with 104,957 tons in 1937.

Seattle — While several large bridge projects are developing, no important tonnages are involved in work up for bids. Shops report a better volume of small jobs but operations are well below capacity.

Shape Contracts Placed

1300 tons, transit shed, Bayonne, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

1085 tons, highway bridge, Oklahoma county, Oklahoma, to the J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

1000 tons, building, Hoboken, N. J., for General Foods, New York, to Belmont Iron Works, Philadelphia.

700 tons, British pavilion, World's Fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.

603 tons, building, West 132 street, New York, to Schact Steel Construction Co., New York.

375 tons, building, Mayo civic auditorium, Rochester, Minn., to Des Moines Steel Co., Des Moines, Iowa.

350 tons, stop logs and lifting beams for tunnels, Fort Peck dam, Montana, to Hansell-Elcock Co., Chicago.

325 tons, warehouse and carbon building, Anchor Hocking Glass Co., Salem, N. J., to Bethlehem Steel Corp., Bethlehem, Pa.

310 tons, industrial building, Thomas A. Edison Inc., Silver Lake, N. Y., to Keystone Steel Construction Co., Trenton, N. J.

310 tons, procurement division, treasury department, seaplane administration building, North Beach, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

295 tons, dimension mill, Beverly, W. Va., to International Steel Co., Evansville, Ind.

270 tons, Powell building, Columbus, O., to American Bridge Co., Pittsburgh.

260 tons, state highway bridge, project 5085, Glen Raven, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.

250 tons, addition, building 57, General Electric Co., Lynn, Mass., to New England Structural Co., Everett, Mass.

250 tons, apartment building, Buffalo, to R. S. McManus Steel Construction Co., Buffalo, Siegfried Construction Co., Buffalo, low.

240 tons, North Carolina & St. Louis railway, bridge 837, Resaca, Ga., to American Bridge Co., Pittsburgh.

200 tons, school, West Newton, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

200 tons, service building, New York Power & Light Co., Schenectady, N. Y., to Clausen Iron Works Inc., Albany, N. Y.

200 tons, warehouse, Steel Sales Corp., St. Louis, to Superior Structural Steel Co., St. Louis.

195 tons, Queen of Angels hospital addition, Los Angeles, to Consolidated Steel Corp., Los Angeles.

190 tons, five bridges in Missouri and Kansas for Missouri Pacific railroad, to American Bridge Co., Pittsburgh.

190 tons, school, Sayville, N. Y., to Belmont Iron Works, Philadelphia; through John Clausnitzer & Associates Inc., Brooklyn.

175 tons, Lady Queen of Martyrs church, Forest Hills, L. I., to Bethlehem Steel Co., Bethlehem, Pa.

166 tons, state bridge, Shelby, Mont., to unstated interest; W. P. Roscoe, Billings, general contractor.

165 tons, building, National Cash Register Co., Worlds' Fair, New York, to Belmont Iron Works, Philadelphia; through William L. Crowe Construction Co., New York.

165 tons, bridges, Mineral and Archulets counties, Colorado, to Midwest Steel & Iron Works Co., Denver.

160 tons, state highway bridge, project 1685, Stilesville, Ind., to Pan-American Bridge Co., New Castle, Ind.

160 tons, Kress store, Ashland, Ky., to Meehan Steel Products Co., Ironton, O.

150 tons, head frames for shafts, Delaware aqueduct, Seaboard Construction Corp., Katonah, N. Y., to American Bridge Co., Pittsburgh.

145 tons, theatre, 51 East Fifty-third street, New York, to Belmont Iron Works, Philadelphia; through Hegeman-Harris Co., New York.

145 tons, addition reception building No. 25, state hospital, Creedmoor, N. Y., to Schacht Steel Construction Co.

140 tons, Seneca Terminal station, Buffalo, to R. S. McManus Steel Construction Co., Buffalo.

140 tons, garage addition, to Fifth Avenue Coach Co., New York.

125 tons, curbing for highway approach, contract WB-32, Triboro Bridge authority, New York, to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, additional, Federal building, fair site, Yerba Buena Island, San Francisco, to Moore Drydock Co., Oakland, Calif.

115 tons, bridge, Pitkin county, Colorado, to unnamed interest.

110 tons, bridge, FAS 752-D, Cass county, Missouri, to Builders Steel Co., North Kansas City, Mo.

108 tons, two-span web flanged bridge, Stowe, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; Charles A. E. LaRose, Ware, Mass., general contractor.

Shape Awards Compared

	Tons
Week ended June 25	**11,387**
Week ended June 18	**31,418**
Week ended June 11	**25,200**
This week, 1937	**59,641**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**16,400**
Weekly average, May	**8,963**
Total to date, 1937	**711,087**
Total to date, 1938	**414,402**

Includes awards of 100 tons or more.

Shape Contracts Pending

3000 tons, Grand river dam and power project, Vinita, Okla., Massman Construction Co., Kansas City, Mo., low on general contract.

2700 tons, conduit linings, specification 789, Grand Coulee dam, bureau of reclamation, Odair, Wash.

2300 tons, state bridge over Green river, Hart county, Kentucky.

2200 tons, bridge over Red river, for states of Texas and Oklahoma.

1500 tons, dam facing, Southern California Edison Co., Big Creek, Calif.

1290 tons, ventilation building, Queens Mid-town tunnel, Manhattan side, New York, to Cauldwell-Wingate Co., New York, low; bids June 21.

1200 tons, hangar, Hickman Field, T. H.; bids June 30.

965 tons, public school, No. 244, Brook-

lyn, N. Y.; Bethlehem Steel Co., Bethlehem, Pa., low.
680 tons, track elevation, Chicago & North Western railway, Kenosha, Wis.; bids July 1.
675 tons, Kansas City Terminal railway bridge, Kansas City, Mo.; bids close June 28.
600 tons, flood control project, Whitney Point, N. Y., United States engineers offices, Binghamton; bids July 1.
500 tons, also unstated sheet piling tonnage, Washington state highway projects; bids in at Olympia.
460 tons, public school, No. 213, Brooklyn, N. Y.; Lehigh Structural Steel Co., Allentown, Pa., low.
385 tons, bridge, Blue, Oklahoma.
350 tons, bridge, Austin, Colo.
300 tons, beam span, RC-3970, Avoca, N. Y., for state.
300 tons, school, administration building and class rooms, Brockport, N. Y.; bids July 7.
300 tons, bridge, state of Washington.
300 tons, Chickamauga dam, Hoobs Island, Ala.
250 tons, grade separation bridge, Mackinac county, Michigan.
240 tons, seesaw lift bridge, Branford, Conn.
240 tons, bridge, Okarehe, Okla.
190 tons, state highway bridge, grade separation, Delaware, Lackwanna & Western railroad, RC-3967, Chanango, N. Y.
175 tons, framing for Seminoe power plant, specification 1085-D, bureau of reclamation, Parco, Wyo.
155 tons, coaling station, Missouri Pacific railroad, Kansas City, Mo.
150 tons, municipal lighting plant building, Kalamazoo, Mich.
135 tons, state grade separation, Clinton, county, Ohio.
125 tons, state bridge, project P-11, Moville, Iowa.
125 tons, bridge, Mifflin Junction, Pa., for Allegheny county, Pennsylvania.
125 tons or more, bridges Roza division, Washington; bids to bureau of reclamation, Denver, June 28.
100 tons, building, state hospital, Tewksbury, Mass.
Unstated tonnage, 536-foot steel and timber state span, Grace, Idaho; bids in.

Reinforcing

Reinforcing Bar Prices, Page 65

New York — After a long period of price weakness, reinforcing bars have been reduced $5 a ton to 2.61c, delivered job, New York district, billet stock, cut lengths in car lots. Considerable volume has moved in recent weeks under the new price and the market will be subjected to further tests on several large tonnage inquiries now pending. Awards are off, but include 300 tons for a Lincoln tunnel approach, New Jersey side.

Pittsburgh — Producers generally have accepted the new base price, which amounts to a $5 per ton reduction. The quotation is now 2.20c, Pittsburgh, as against 2.45c formerly. Price from other points is 2.25c, with the Gulf port base price, 2.65c. The Pacific coast price remains unchanged. Bending extras on consumer orders are now generally being quoted 10 cents lower, the reduction being from 90 to 80 cents on ¼ to ⅜-inch bars, and from 40 to 30 cents on other sizes. However, occasional orders are still being placed at the old base of 2.45c. On the other hand, some orders are reported placed even below the present quotation of 2.20c, Pittsburgh. There is a substantial amount of tonnage in the market now, with orders still coming out.

Cleveland — Recent adjustment of $5 per ton on rail steel and new billet reinforcing bars has failed to stabilize the markets as anticipated. The bending extras were also lowered from $8 to $6 for above ⅜-inch and from $18 to $16 for ⅜-inch and under. Current demand from private sources is limited to tonnages ranging under 50 tons. Requirements from public sources are more encouraging with 300 tons recently placed with Truscon Steel Co., Youngstown, O., for a WPA project, Cuyahoga county, Ohio.

Chicago — With one exception inquiries for more than 100 tons are virtually unknown but volume of

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Behind the Scenes with STEEL

The Other Half

■ *The New Yorker* got right down to technical rock bottom a couple of weeks ago. They scooped us poor amateurs by "telling all" about construction welding. The cute little helmets with opaque glass were described and a fashion note on life belts was included. When they explained the engineering details about the joining metal and the low voltage, however, we were stumped and had to call on Erle Ross, engineering editor, for help. Quickly grasping the true significance of it all, Erle cursed softly. Stealing our stuff, were they, says he and we could see his nimble brain at work. So don't be surprised, dear reader, to find in STEEL one of these hot summer days a review of the new Broadway plays, an interview with Gypsy Rose Lee and a Steig cartoon about that lady you was seen with last night.

Big Order

■ And then on the other hand we must have quite a reputation. From down in Eliasville, Texas, G. B. Strunk post cards us "for full information on iron & steel". Nothing more, nothing less.

Return of the Native

■ New editorial blood began to trickle into STEEL's veins this week. The source is handsome, capable, Charles Van Voorhis recently of Cape Palmas, Liberia, West Africa. Van hails originally from Beech Bottom, West Virginia where he steel-milled for one year while in school. He modestly acknowledges a Phi Beta Kappa key at home in the bureau drawer and blushes to tell how he was an alternate Rhodes scholar. From handling publicity for the late Van Sweringens he moved into the adv. dept. of Firestone. Thence to Liberia and two years at running a rubber plantation office, with some seven or eight thousand natives employed in the fields. No tall story teller, Charlie nevertheless willingly spins yarns about Buzi "debbils" and playful pythons.

Anything on the Hair?

■ Last week we back-patted Richard L. Gridley of the *Pittsburgh Press* for back-patting STEEL's recent editorial on price announcements. Now back comes Mr. Gridley with one more pat. Says he: "Apparently the boys around here really comb through your magazine because they were calling me up before I received my own copy". For some silly reason that reminds us of that street-intersection up in Detroit where there should be a barber shop on all four corners. Next time you're up there ask someone where you can find Macomb & Brush.

Word Game

■ Did you take a squint at page 73? Or did you think page 73 was taking a squint at you! We clamped our eyes on SOJUZUGLEEXPORT and couldn't rest until we unscrambled it. We have been plugging away now for over an hour and are stuck. We deciphered something like: *Joe Sez Plug Routx*, but that doesn't seem to make much sense. A short beer is offered for anything better.

Introducing . . .

■ Hardworking, likeable E. C. Kreutzberg took time out last week to intimate it was high time we give a little plug for his prize-winning heir, Dick. Although only eight months young, he-man Dick is reputed to have the rippling muscles of a Tarzan, the catching personality of a Baby Leroy and the good common sense of a modern A. Lincoln. Only known drawback to date is equally hardworking, equally likeable Uncle Emil K., star space shagger and STEEL's eastern manager.

—SHRDLU

these small projects is encouraging and total tonnage shows an improvement. Largest of the new pending projects involves 550 tons for St. John's hospital, Springfield, Ill. The many small inquiries comprised mostly buildings and road work.

Boston — More small-lot tonnages are being placed, including several highway projects in Vermont, but new inquiry is off slightly. Contracts include 240 tons of highway fabric, for Connecticut, placed by a Providence, R. I., contractor. Few active projects require 100 tons or more.

Philadelphia — The war department, Washington, will spend several millions for the Susquehanna river flood control work, including $2,065,000 for Wilkes-Barre and Hanover townships, Pennsylvania, and $1,204,300 for Kingston and Edwardsville, involving considerable bar tonnage. Current volume of work is light and prices are soft. McCloskey & Co., Philadelphia, have taken no action on 2350 tons for the Washington printing plant.

Cincinnati — Inquiries on pump-priming projects have not yet come out. Considerable tonnage of reinforcing will be required in a prison construction proposed at LaGrange, Ky., and also for a school building in Lexington, Ky. M. P. Severin Co., Chicago, are reported low for a building at the soldiers' home Dayton, O., involving 400 tons.

San Francisco — While over 24 projects were awarded recently only three involved 100 tons or over. The largest went to Colorado Fuel & Iron Co., Denver, involving 171 tons for the bureau of reclamation, for delivery at Ignacio, Colo. Columbia Steel Co. submitted the low bid on 7721 tons for the United States Engineer office, Los Angeles. Awards totaled only 867 tons, bringing the year's aggregate to 46,771 tons, compared with 42,163 tons last year.

Seattle — Public works continue to purchase the bulk of the small tonnages moving. The largest order

Concrete Bars Compared

	Tons
Week ended June 25	**2,016**
Week ended June 18	**3,039**
Week ended June 11	**4,990**
This week, 1937	**11,133**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**5,269**
Weekly average, May	**5,872**
Total to date, 1937	**145,290**
Total to date, 1938	**137,010**

Includes awards of 100 tons or more.

pending involves 4000 tons of deformed bars, bids to Reclamation bureau, Denver, June 22, for shipment to Coulee dam. The week's awards include 200 tons in Washington state highway work to Northwest Steel Rolling Mills, Seattle. Tonnages pending include 415 tons for the Black Canyon project, Idaho.

Reinforcing Steel Awards

300 tons, Doan brook sewer, Cleveland, to Truscon Steel Co., Youngstown, O.

290 tons, approach foundations, Lincoln tunnel, North Bergen, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; I. B. Miller Co., New York, general contractor.

230 tons, joists, apartment building, Buffalo, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, Parco, Wyo., reclamation project, to Colorado Fuel & Iron Co., Denver.

200 tons, Washington state highway projects, to Northwest Steel Rolling Mills, Seattle.

171 tons, bureau of reclamation, invitation 32,044-A, Ignacio, Colo., to Colorado Fuel & Iron Co., Pueblo, Colo.

150 tons, navy requisition No. 40-X-860, Boston, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, navy yard, Boston, to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, engineering and shop buildings, Agfa Ansco Corp., Binghamton, N. Y., to Truscon Steel Co., Youngstown, O.

100 tons, power house, Link Belt Co., Indianapolis, to Truscon Steel Co., Youngstown, O.

100 tons, University of Idaho building, Moscow, to Bethlehem Steel Co., Seattle; H. S. Wright & Co., Seattle, general contractor.

Reinforcing Steel Pending

7721 tons, United States Engineer office, proposal 598, Los Angeles; Columbia Steel Co., San Francisco, low.

9000 tons, for Grand river dam and power project, Vinita, Okla., Massman Construction Co., Kansas City, Mo., low on general contract.

4000 tons, deformed bars, reclamation projects; bids in.

550 tons, St. John's hospital, Springfield, Ill.

500 tons, building, Lever Bros., Cambridge, Mass.

400 tons, United States Veterans administration for soldiers' home, Dayton, O., bids at Washington, M. P. Severin Co., Chicago, low.

369 tons, bureau of reclamation, invitation B-42,085-A, Knob, California; bids opened.

209 tons, proposal No. 516-38-180, army engineers, Huntington, W. Va.

200 tons, Washington state highway work; bids opened at Olympia, June 21.

200 tons, Oregon state highway work; bids in.

197 tons, United States Engineer office, invitation 868-38-209, San Francisco; bids opened.

162 tons, bridge over Santa Clara river, Los Angeles county, California, for state; bids July 7.

150 tons, warehouse, General Electric Co., Minneapolis.

138 tons, theater, Oakland, Calif.; bids opened.

130 tons, Cache creek bridge, Yolo county, California; bids July 6.

100 tons, post office, Janesville, Wis.

100 tons, highway bridge, state of Illinois.

100 tons, addition to Jewish hospital, Cincinnati, bids on general contract July 30.

100 tons, hospital at Butlerville, Ind.

100 tons, power plant, Kalamazoo, Mich.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—The tonnage of pig iron moving in the Pittsburgh district is slowly increasing with an expansion of foundry activity. Although most purchases are in small lots, they are increasing in number. Prices are firm, with no reported cases of price shading in this district.

Cleveland — Sellers report current orders from miscellaneous consumers represent only actual needs for immediate delivery despite the fact inventories of most users are well depleted. However, operating schedules of most consumers are still on a two or three-day weekly schedule and as long as this condition exists few nor-

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mally large users are interested in buying ahead. Inventory position of most sellers, while not out of hand, is said to be proportionally higher than consumers despite drastic curtailment in operations the past 60 to 90 days. Prices remain steady.

Chicago—Shipments for the first 20 days of this month, compared with the same period in May, are in general off 20 per cent, although one producer has experienced a slight increase. Estimates for the month's shipments indicate that this decline is likely to carry through. Foundry operations are no better. Producers of auto castings are slowing operations and are expected to be down presently.

Boston — Although foundry melt is improving in spots, demand for pig iron continues light with shipments confined to a scattered car lot and truck deliveries. Releases against contracts are slightly better, but buying is slow. Prices are firm and unchanged with little pressure for concessions.

New York — Pig iron shipments and sales are limited to scattered car lots, sellers shipping three to four cars a week as the end of second quarter approaches. Foundry melt, not better than 25 per cent as whole, may be down slightly next week. Pig iron producers, however, confidently look for at least a mild upturn during the first of next quarter, estimating that at least 70 per cent of consumers are low on inventories. Prices are unchanged with little pressure for concessions.

Philadelphia — No change is apparent in buying policies of pig iron users. Occasionally several hundred tons is placed but generally purchases are car lots or less. Foundry operations are estimated at 35 per cent. Some jobbing foundries are more active. The report in the trade is that the Riddlesburg, Pa., furnace will be dismantled.

Buffalo—Pig iron shipments are still at a low ebb, but spasmodic improvement is lending some hope that a marked upswing in business may be in the offing. No releases exceed a single carload lot, which is taken to indicate consumers are forced to buy for immediate needs. Melting continues to lag as foundries operate an average of two days a week.

Cincinnati — Pig iron shipments started slowly this month and gradually increased until now there is possibility tonnage will equal May. Most business is in spot shipments, few foundries showing schedules better than two days a week. Despite lack of buying for future needs, furnace interests believe prices will hold firm and demand speedily increase after the midsummer low.

Birmingham, Ala. — Pig iron production is dragging with only five active stacks and building its hopes largely on what the government might do in utility improvements.

Seattle—Pig iron is moving slowly. Prices for third quarter will remain unchanged at $22 base, 1.75 to 2.25 silicon. However, the delivered price may advance 55 cents June 30 if proposed higher freight rates become effective. Foundry operations are unusually low and volume of sales is limited.

St. Louis — The number and aggregate amount of small lot purchases of pig iron for immediate shipment is showing gratifying expansion, indicating at least steady operations and diminishing inventories.

Shipments are at a higher daily rate than in May and about on a parity with April. According to sellers the movement for the month will exceed that of its predecessor by a fair margin.

The melt is spotty, with seasonal reductions at certain plants offset by steady to slightly increased activities elsewhere. Farm implement interests have curtailed, while stove and heating apparatus manufacturers have slightly increased production.

Toronto, Ont.—Merchant pig iron sales are steady. Melters are showing interest and inquiries for third quarter are making their appearance, but so far tonnages involved are small. Producers, have opened books for third quarter and expect sales to exceed those of earlier periods. Current sales continue in lots up to 500 tons, with average sales of 100 to 200 tons. Sales for the past week totaled around 2500 tons. Deliveries against contract are going forward on schedule, adding another 2000 tons to weekly deliveries. The daily melt continues around 70 per cent of capacity, which is believed to be the peak until after the summer season.

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

Scrap

Scrap Prices, Page 68

Pittsburgh—All grades of scrap in the Pittsburgh district have been marked up over the past week, with No. 1 heavy melting steel leading. Sudden releases from several mills on previous orders placed at higher prices seem to be the deciding factor. Brokers are covering on these contracts up to $12, and although the last mill sale was at $12 to a mill in the immediate vicinity, it is doubtful if any No. 1 steel could be obtained today at less than $13.

Chicago — Scrap declines have ceased and greatly improved sentiment plus renewed mill buying have advanced prices here $1 a ton and more. One local steelworks has purchased 10,000 tons, including heavy melting steel and bundles, the purchase being based upon a $11 price for No. 1 steel, up $1 a ton.

Philadelphia — The scrap market

is buoyant with prices moving rapidly. Both yard dealers and industrial plants are holding back accumulations in anticipation of higher prices. Brokers are not paying $12 freely against contracts and the market is strong at $12 to $12.50 for heavy melting steel. Mills are unable to buy No. 2 steel at less than $10.50. Specialty grades have not yet participated in the upturn although sales of shafting have been reported at $19.50. The Philadelphia Rapid Transit is holding a 3000-ton list, including heavy melting steel, at $10.50, f.o.b., equivalent to $12, Coatesville, Pa. Export movement is quiet except for one cargo shipped against an old order.

Cleveland — Purchase of 20,000 tons of scrap by a Youngstown, O., district steelmaker at $12 for No. 1 heavy steel, which has touched off the Pittsburgh market and in one day marked up the price by $2 in the valley, as yet has had only sentimental effect upon the Cleveland market. Mills and foundries still are out of the market as to actual purchases of size, although small lots continue to move.

Sentimentally, heavy steel in Cleveland has been marked up $1 a ton as also are pressed sheets, and No. 2 busheling and cast borings are up 50 cents.

Boston — Scrap prices are slightly stronger on several grades while others are unchanged. The downward trend appears to have been definitely halted although there has been no improvement in domestic demand for district or Eastern Pennsylvania shipment. Some brokers offer $9.50, dock, for No. 1 heavy melting steel while others hold at $9.

New York—Bullish operations on the part of a leading export broker not involved in the last 370,000-ton sale to the European cartel has caused sellers of the cartel tonnage to lift prices to $10, barge, for export delivery, No. 1 heavy melting steel, with $8.50 for No. 2. These quotations are practically identical to that paid F.A.S. by foreign buyers for the last tonnage. Other grades for export have been jumped materially, brokers bidding $7.50, barge for stove plate and $8.50 for No. 2 cast. For domestic shipment stove plate is up close to $1 a ton and No. 1 machinery cast is 50 cents higher. Domestic volume is light with Coatesville, Pa., reported paying $12.50 delivered for No. 1 heavy melting steel. As a result of bull operations for export tonnage, the market is mixed on material destined for barge delivery although scrap is not coming out freely at current prices.

Buffalo—With definite sales in the Pittsburgh market at higher prices, the tone in the iron and steel scrap market continues to strengthen. Dealers have refused to sell to the chief consumer of the district at lower bid prices in hopes that the market had reached the bottom. The mill is bidding $10.50 a ton for No. 1 heavy melting steel but has received barely 1000 tons during the four weeks the bid has been in the market.

A sale of about 10,000 tons of scrap, principally No. 1 and No. 2 steel and including some bundles, has been closed for a consumer on the basis of about $11.50 for No. 1 steel.

The market is not completely dormant as 2000 to 3000 tons a week is moving into yards of the main purchaser against old contracts. An occasional sale of cast scrap is also reported to foundries at $13.50 a ton for best material.

Detroit — Sentiment among dealers and broker is improving and the recent Fisher list is claimed to have brought higher prices, bundles going at a reported figure of $8. Pending confirmation of this increase, the price is marked up 25 cents to a range of $7.25 to $7.75.

It is confidently expected lists which come out in the next week to 10 days will meet with higher prices.

Appearance of a tonnage of heavy breakable cast in excess of 1400 tons has depressed this grade $1 to $9.00 to $9.50, mainly because of the lack of good demand from die foundries. But this is not considered representative of the market trend.

Recent purchase by a steelmaker here was not to cover immediate needs, but to take advantage of the current low prices.

Cincinnati—Scrap shows strength reflected from sales in nearby districts which are not, however, at prices high enough to attract material from here. Quotations stand unchanged as consumer demand has not yet revived. A few items from June railroad lists were bid in by district interests. The Louisville & Nashville railroad withdrew some of the material offered.

St. Louis — Influenced by entire lack of consumer interest and heavier offerings from country dealers and the carriers, the market for scrap iron and steel continues to drift downward. Purchasing by melters is almost entirely absent, and nothing of importance is looked for six weeks to two months. However, there is no distress scrap and melters are taking in all that is owed them on contracts.

Despite the steady price declines

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It's not difficult to make rings and bushings from solid steel—but it *is* wasteful.

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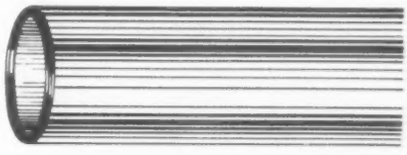

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367 Main St., Buffalo, New York

ORDER FROM STOCK

of recent weeks, quotations here are still out of line with other points, and the latest downward revisions are in the nature of adjustments, as no sales have taken place upon which to base accurate values.

A number of mills have large inventories of scrap, and on the basis of present operations, sufficient to last them well into the winter. Smaller users, including jobbing foundries, are scantily supplied.

Birmingham, Ala.—Scrap is unchanged and inactive with foundries taking the little moving currently.

Toronto, Ont.—Trading in iron and steel scrap is quiet with only a few special grades drawing attention. Local dealers state that offerings are smaller and only the less active materials are coming into yards. Steel mills in the Hamilton district have open orders for heavy melting steel with the result that dealers are getting no inquiries, while on the other hand they have only small tonnages to pass along to the mills.

Turnings have become more active recently and a few good sales have been reported. Foundries and electric furnace operators are taking iron scrap when offered and there is a strong demand for cast iron. Stove plate is becoming scarce and some dealers state they have had no offerings for months and their holdings have been cleaned out.

Seattle—Exporting houses are receiving small orders from Japan as permit and credit restrictions are severe and importers find it difficult to make financial arrangements. There is no indication what quantity Japan will be able to purchase during third quarter. Tidewater stocks are rather low in view of heavy shipments during the spring. In the absence of sales it is impossible to quote but the market is unquestionably weak. Interior shippers are not forwarding as they cannot sell at current tidewater prices.

Warehouse

Warehouse Prices, Page 67

Pittsburgh—A slight gain in orders has been noticed by warehousemen and the general picture continues unchanged, with inventories everywhere on the bottom and orders representing immediate needs of consumers. Prices appear to be holding, except in a few isolated cases.

Cleveland — Little new business has developed this month to offer much encouragement to distributors. Order volume has been fairly well maintained, although individual tonnages are small. Recent estimates of shipments out of jobbers' stocks for June predict a slight decline from May. However, total stocks are said to be still out of proportion to current demand and no substantial buying can be expected from this source in the near future. Announcement of price revision on certain items is expected soon.

Chicago—There are no changes in sales volume but new price cards have been issued and attention is on the changes made there. Principal innovations include reduced base prices on some forms of sheets and strip, simplifying of classifications in regard to plates, sheets and strip, and a new quantity differential plan.

Philadelphia — Jobbers have revised galvanized sheets, with one to four bundles 5.25c, five to 24 bundles 5.00c, 25 bundles and over 4.75c. Copper-bearing galvanized sheets take a 25-cent extra. Warehouse sales show further gain with June expected to prove the best month so far this year.

Buffalo—Warehouse sales resistance is leading some distributors to believe the market may be pulling out of the doldrums. No price changes have been announced but some downward revision in prices of flat-rolled products is anticipated.

Detroit — Improved sentiment locally has not been reflected to any extent in an upward movement of warehouse sales, although the volume of small rush orders is holding at a good level. Some encouragement is derived from shortening of summer shutdown periods among automobile producers. As yet no change has been officially announced on galvanized sheet prices, although some realignment is expected momentarily.

Cincinnati — Although spotty, sales of jobbers are moderately higher than last month. Little steel is moving except for industrial needs. Price changes in sheets, following mill announcements are imminent, probably effective this week.

St. Louis — Sales of steel from warehouses are holding steady with the opening week of June, but are measurably below a year ago. Individual orders continue of unusually small size, and represent only immediate requirements. Except for oil country goods, carlot shipments during the past several weeks have been rare.

Seattle—Turnover is irregular, mostly hand to mouth buying in small tonnages. June volume is about the same as in May. Sales are confined mostly to miscellaneous items, mill buying being nominal. Sheet prices will probably be revised before July 1 in line with mill schedules.

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CAMPBELL TRANSPORTATION COMPANY

THROUGH BARGE FREIGHT MOVEMENTS: PITTSBURGH, ST. LOUIS, NEW ORLEANS, HOUSTON, GALVESTON, AND INTERMEDIATE POINTS

GRANITE BUILDING, PITTSBURGH, PA.

Iron Ore

Iron Ore Prices, Page 68

New York—Turkish chrome ore has been reduced $1 a ton, with 48 to 49 per cent concentrates and 48 to 49 per cent lump ore now holding at $24.50 to $25.50 per gross ton, c.i.f. seaboard. The new prices are believed to reflect a further easing in ocean freight rate. However, they are nominal, for buying here is and

has been negligible for a number of weeks.

Indian chrome ore prices are nominally unchanged at levels prevailing for more than a month.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—Tin plate production continues to decline. Because canmakers are not pressed at the moment and with an obviously firm price situation, with no tendency to move downward and an upward revision practically an impossibility, there is no reason for the tin users to lay in heavy stocks. Relatively low production schedules also insure an almost immediate delivery and canmakers have been able to conserve their cash position until the summer packing season begins. Present indications are that the pea pack, the first crop, will approximate last year's quantities. With the advent of this, it is expected tin plate production will rise above the 35 to 40 per cent level now being experienced.

Baltimore — The pea crop in the Tri-state area, which comprises this district, is off fully 15 per cent, and as there is also a substantial carryover of containers, some sellers here estimate that production as a whole for this crop is off around 30 per cent from last year. Specifications are fairly sustained for the packing of sea food, but in most lines there is a decline, with prospects for the summer none too encouraging. As Baltimore district is the country's largest consumer of tin plate, the lag in this product is having an appreciable effect on the total tonnage of steel being fabricated here.

New York—Buying is slow with shipments not better than 50 per cent of last year's rate with some mills. Canmakers are well stocked, although some buying is expected next quarter, part of which will be filled by completed stock now held by mills awaiting specifications.

Coke By-Products

Coke By-Product Prices, Page 65

New York—With the exception of benzol, demand for distillates has declined. Production is light, however, and stocks are not piling up. Current production of benzol is being absorbed. Prices are unchanged with one degree toluol quoted 26.00c in tank lots and two degree material 22.00c. Industrial demand for phenol is small and the household season for naphthalene has been slow to start. After a good spring season for sulphate of ammonia, sellers now experience a slack period with a price announcement to cover next season's business expected soon.

Steel in Europe

Foreign Steel Prices, Page 67

London — (*By Cable*) — Demand for pig iron and steel in Great Britain continues slack. Imports from the Continent have been checked but pig iron from India continues to come in duty free. Heavy steelworks in Scotland are busy with shipbuilding and government work but other departments are gradually clearing past contracts. Trade in sheets is stagnant. Iron and Steel Merchants Federation has been constituted by a number of firms, including six of the most prominent.

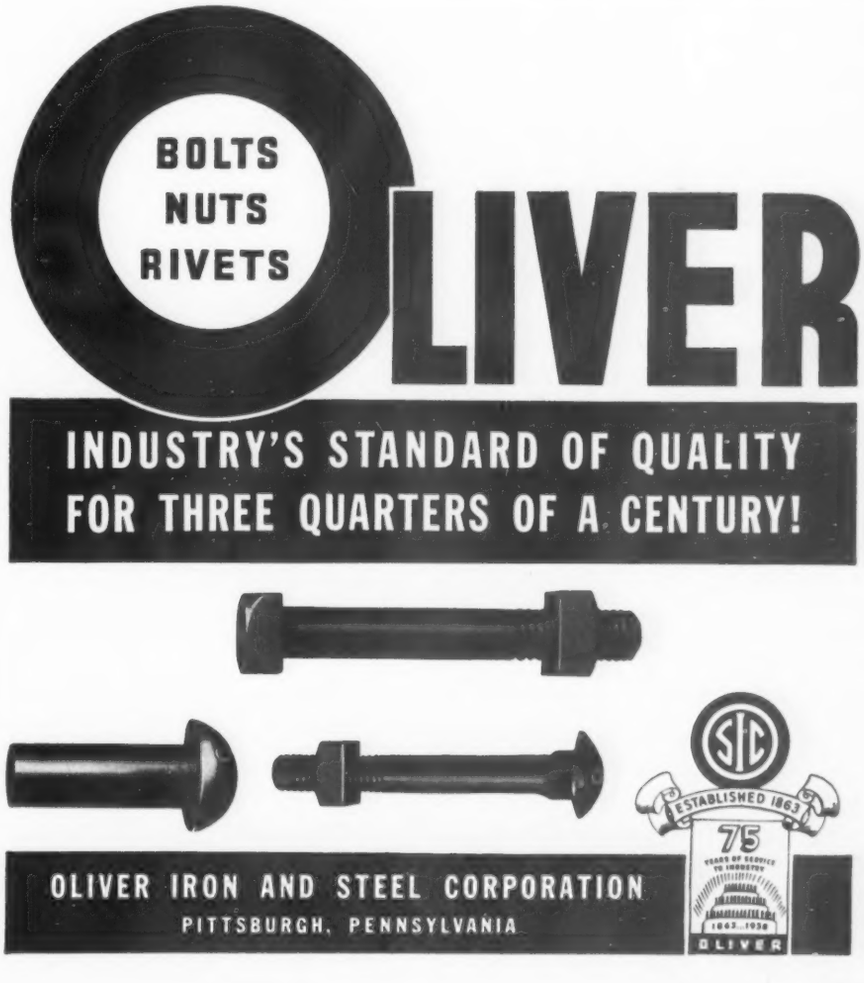
The Continent reports trade is quiet and cartel prices are unchanged. Gradual improvement in demand and production is foreseen.

Iron Ore Leads Imports

Philadelphia — Chrome ore imports here during the week ended June 18 amounted to 7500 tons, of which 2500 were from South Africa and 5000 from the Philippine Islands.

Additional movement of Czech ferromanganese was noted, the total for the week being 300 tons. Other imports were: steel tubes, 23 tons from Sweden; forgings 20 tons from Sweden; steel bars, 11 tons from Sweden, 50 tons from Belgium and six tons from France; steel bands, 18 tons from France and 49 tons from Belgium; hoop steel, five tons from Belgium; structural shapes, 199 tons from Belgium and 25 from France.

Baltimore—Imports of iron ore at this port during the period, May 30 to June 12, increased considerably compared with the preceding half month. Four large shipments of Chilean iron ore from Cruz Grande, being individually 21,500, 11,000, 21,800 and 22,500 tons. In addition 7935 tons of iron ore arrived from Narvik, Sweden and 11,000 tons from Daiquiri, Cuba. Chrome ore imports totaled 1808 tons from Lourenco Marquis, Portuguese East Africa and 1300 tons from Aghai, Marina, Greece. Also 3200 tons of manganese ore arrived from Santiago, Cuba.



Nonferrous Metals

New York — Paced by Wall street securities and supported by higher prices in London, nonferrous metals advanced last week on heavy consumer buying. While electrolytic held unchanged export copper advanced nearly $15 per ton; lead and zinc advanced $10 per ton; and tin rose about $37 per ton. Consumers covered needs over the immediate future and began replenishing their stocks.

Copper — Supplies of copper available at 9.00c, Connecticut, were ample to care for all inquiry. Sales jumped to over 1500 tons on each of the first three days, to over 7000 on Thursday and 5000 on Friday. Export copper closed at around 9.30c, c.i.f. European ports.

Lead — Sellers advanced prices to 4.50c, New York, and 4.35c, East St. Louis, when demand exceeded daily ore intake plus tonnages which sellers were willing to release from reserve stocks. All classes of consumers in all sections of the country were represented.

Zinc — While demand was not as heavy as in lead, consumers bought actively and absorbed all offerings under 4.50c, East St. Louis, the closing price.

Tin — Sellers were disappointed that consumers did not show an active interest in the market in view of general strength in metals. Following the trend in London, Straits spot soared to around the 43-cent level from 41.00c at the end of the previous week. Tin plate operations continue at a slow pace.

Antimony — Buying was more active on only one day. Prices held unchanged at 11.75c, New York, for American spot and 14.00c, duty paid New York, for Chinese spot.

Steering Gears Placed

Boston — Hyde Windlass Co., Bath, Me., at $461,646, has been awarded the contract for electric-hydraulic steering gears for two warships building at the Brooklyn and Philadelphia navy yards, bids May 17, schedule 3136, lot 50.

■ Koppers-Rheolaveur Co., an affiliate of Koppers Co., Pittsburgh, has booked an order from McNally-Pittsburgh Mfg. Corp. for two Carpenter centrifugal dryers, each with capacity of 40 to 50 tons of coal per hour, to be installed in the coal washing plant of the United States Fuel Co., Hiawatha, Utah.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

	Copper										
June	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
18	9.00	9.12½	8.52½	41.05	41.15	4.00	3.85	4.00	20.00	11.75	35.00
20	9.00	9.12½	8.52½	41.50	41.65	4.00	3.85	4.00	20.00	11.75	35.00
21	9.00	9.12½	8.52½	42.10	42.25	4.00	3.85	4.00	20.00	11.75	35.00
22	9.00	9.12½	8.52½	42.25	42.40	4.25	4.10	4.25	20.00	11.75	35.00
23	9.00	9.12½	8.52½	42.65	42.80	4.35	4.20	4.25	20.00	11.75	35.00
24	9.00	9.12½	8.52½	42.90	43.15	4.50	4.35	4.50	20.00	11.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high) 15.62½
Copper, hot rolled 17.12½
*Lead, cut to jobbers 7.50
Zinc, 100-lb. base 9.75

Tubes

High, yellow brass 18.37½
Seamless copper 17.62½

Rods

High yellow brass 11.62½
Copper, hot rolled 13.62½

Anodes

Copper, untrimmed 14.37½

Wire

Yellow brass (high) 15.87½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York 4.50-4.75
*Cleveland 5.50-5.75
Chicago 4.75-5.00
*St. Louis 4.75-5.25

Heavy Copper and Wire

*New York, No. 1 ..... 6.50-6.75
*Cleveland, No. 1 ..... 6.25-6.50
*Chicago, No. 1 ..... 6.37½-6.62½
*St. Louis 6.00-6.50

Composition Brass Borings

*New York 3.75-4.00

Light Copper

*New York 5.00-5.25
*Cleveland 5.00-5.25
*Chicago 4.75-5.25
*St. Louis 4.75-5.25

Light Brass

Cleveland 2.75-3.00
*Chicago 3.12½-3.37½
*St. Louis 3.00-3.25

Lead

New York 3.00-3.25
Cleveland 2.75-3.00
*Chicago 3.00-3.12½
*St. Louis 2.75-3.00

Zinc

New York 1.75-1.87½
Cleveland 1.50-1.75
*St. Louis 1.75-2.00

Aluminum

*Borings, Cleveland 3.75-4.00
*Mixed, cast, Cleveland 5.75-6.00
*Clips, soft, Cleveland 11.25-11.50
*Mixed, cast, St. Louis 6.00-6.50

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads .. 9.25
Standard No. 12 aluminum 14.00-14.50

Select Most Beautiful Bridges Built in 1937

■ Four bridges, acclaimed the most beautiful completed in 1937 in the tenth annual contest of the American Institute of Steel Construction, will be decorated with stainless steel plaques. Competition was in four classes, monumental, medium, small-size bridges and movable bridges.

The winners, announced last week: Golden Gate bridge, San Francisco; Little Hell Gate, low level bridge, New York; Chesterfield-Brattleboro bridge, New Hampshire; Marine Parkway bridge, New York.

Two other spans, Northern Boulevard bridge, New York, and Shark river bridge, New Jersey, were awarded honorable mention.

Bethlehem Steel Co. was the fabricator of the Golden Gate and Chesterfield-Brattleboro bridges, and American Bridge Co., Pittsburgh, was the fabricator of the Little Hell Gate and Marine Parkway bridges.

Engineers were: Joseph B. Strauss, chief engineer, and O. H. Ammann, L. S. Moisseiff and Charles Derleth Jr., consulting engineers, Golden Gate bridge; O. H. Ammann, chief engineer, Allston Dana, engineer of design, Aymar Embury II, architect, Little Hell Gate bridge; John W. Childs, bridge engineer, Harold E. Langley, designing engineer, Chesterfield-Brattleboro bridge; Madigan-Hyland, consulting and supervising engineers on entire project, Waddell & Hardesty, consulting engineers on design of lift and flanking spans, Robinson & Steinman, consulting engineers on design of deck spans and Aymar Embury II, consulting architect, Marine Parkway bridge.

Market Research Source Book in New Edition

■ "Market Research Sources, 1938," has been issued by the department of commerce as No. 55 of the domestic commerce series, available at 30 cents from the superintendent of documents, Washington.

The new issue brings up to date the record of marketing research and about 5000 recent market research reports by governmental and non-governmental organizations are recorded, with the name and address of each source. The contents have been improved since the former issue in 1936 and the system of numbering individual entries has been elaborated to make it more easily usable.

A suggested list of periodicals for

consultation to obtain current articles is included.

Industrial Machinery Exports Gain in May

■ United States exports of industrial machinery in May totaled $23,544,012, a 15 per cent increase over May last year, according to the machinery division, department of commerce, Washington. Exports of farm equipment in May were valued at $6,545,386, one per cent greater than in the corresponding month last year.

Hook and Swope Named To Labor Study Board

■ Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and president, National Association of Manufacturers, has been appointed by President Roosevelt to the committee which will make a study of the British labor disputes act and Swedish labor relations. Gerard Swope, president, General Electric Co., Schenectady, N. Y., has also been named to the committee.

River Shipments Off In Pittsburgh Districts

■ River shipments of iron and steel products in the Pittsburgh district showed a slight decline from April to May. On the Ohio river, 75,750 short tons were shipped during May, against 82,200 tons in April, a decline of 6450 tons. On the Monongahela, 38,450 tons were shipped during May, a decline of 13,330 tons from April. Allegheny river carried only 488 tons, against 1450 tons in April, a decline of 962 tons.

In May, 1937, the Ohio river carried 102,200 tons; the Monongahela, 92,150; the Allegheny 19,000.

Shipments of all products in May totaled 1,082,973 tons on the Monongahela, 679,488 tons on the Ohio, and 155,547 tons on the Allegheny. This is a decline of more than 150,000 tons from April.

Swedish Iron and Steel Industry in Recession

■ Abatement in Swedish business and industrial activity, which began late in 1937, continued during the first quarter of 1938, according to the American commercial attache at Stockholm to the commerce department. Quotations for some iron and steel products were revised downward during the quarter. As regards raw materials for the steel mills, the price decline has become general and little trouble is encountered in obtaining requirements at relatively short notice.

Production of iron and steel in Sweden for the first quarter of 1938 fell below that of the relative period last year. Pig iron output was 181,000 metric tons, compared with 154,700 tons last year. Ingots and iron blooms and rough bars produced this year amounted to 242,400 metric tons against 266,100 tons in the first three months of 1937. Output of finished rolled and forged iron and steel dropped from 182,000 metric tons in the first quarter of 1937 to 150,800 tons in the first quarter of 1938.

Living Costs Down From April to May

■ Wage earners' living costs declined 0.3 per cent from April to May, according to the National Industrial Conference board. May living costs were 2.6 per cent below those of a year ago, 12.6 per cent below those of May, 1929, but 20.6 per cent above the low point of 1933. Purchasing value of the dollar in May was 115.6 cents, against 115.2 in April, 112.6 in May, 1937, and 100 cents in 1923.

Equipment

Detroit — Revived confidence in the outlook for equipment business has yet to be translated into orders, but a better feeling is evident everywhere. Last of the new machines for the new engine plant of General Motors Truck at Pontiac was installed last week and production should start shortly on a new line of truck engines; machine capacity for 30 per hour is provided. Equipment for the maintenance department of the new Dodge truck plant here is still held up as far as delivery is concerned, and it will soon be eight months that this postponement has been in effect.

Machinery for the new Ford tool and die shop already delivered is being stored in the open at the plant, delivery on the balance being delayed pending completion of the building. Contract for about $75,000 worth of electric hoists for the new Ford building was expected to be placed last week.

Seattle — Link-Belt Co., Seattle branch, has been awarded at $22,432 the contract to supply a conveyor system for the University of Washington heating plant. Reclamation bureau, Denver, has called bids June 28 for 2300-volt motor control equipment for the Glendive, Mont., pumping plant. Fort Lewis, Wash., opened bids June 17 for furnishing 120 water heaters and 160 range boilers. Tacoma has awarded a contract for a 1000-kilovolt transformer, and is considering tenders for voltage regulator, circuit breakers and 20 tons of copper wire. Puget Sound navy yard will open bids June 30 for copper cable and a 60-kilowatt generator.

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If your stamping job is a difficult one, let us demonstrate a first class part can be made.

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3100 CARROLL AVE. CHICAGO

Construction and Enterprise

New York

NEW YORK—Norwood Steel & Iron Works, Bronx, recently formed, has leased a one-story building, 50 x 100 feet at 615 Tiffany street.

NEW YORK — Duffy Construction Corp., 230 Park avenue, has been awarded general contract by New York Central Railroad Co., 466 Lexington avenue, for extensions and improvements in repair shop and storehouse. Cost with equipment $50,000.

NEW YORK—American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, has contracted for purchase of acreage at Mobile, Ala., for construction of plant, first unit to be used for production of sulphate of alumina, and has also procured tract of land in Savannah, Ga., for a plant to manufacture miscellaneous heavy chemicals, including sulphate of alumina.

NIAGARA FALLS, N. Y.—Electric City Paper Mills Inc., 25 Adams street, let contract to August Feine & Sons Co., 140 Terrace street, Buffalo, for erection of one-story mill, replacing unit recently destroyed by fire. Cost $50,000 with equipment.

WATERVLIET, N. Y.—Commanding officer, ordnance department, Watervliet Arsenal, will take bids until July 5, circular 112, for three or four milling machines, and circular 115, one or two automatic reproducing machines.

Connecticut

HAMDEN, CONN.—Whitney Blake Co., Doxwell avenue, maker of insulated wire and cable, plans one-story addition, to cost over $70,000 with equipment.

SEYMOUR, CONN. — Kerite Insulated Wire & Cable Co. has started building a two-story addition to its plant here. Award for construction went to H. Wales Line Co., Meriden, Conn.

Massachusetts

WATERTOWN, MASS.—Commanding officer, ordnance department, Watertown Arsenal, will take bids until July 4, circular 117, for one 1200-kilowatt motor generator set.

Pennsylvania

FORD CITY, PA.—United States engineer's office, 925 New Federal building, Pittsburgh, is taking bids due 10 a. m., July 1, for one 20-ton floor controlled electric traveling operating house crane, complete with all parts.

TIONESTA, PA.—United States engineer's office, 925 New Federal building, Pittsburgh, is taking bids due 10 a. m., July 1, for one 20-ton floor controlled electric traveling operating house crane, complete with all parts.

WHITE HAVEN, PA.—White Haven Sanitorium association, Dr. F. A. Craig, president, care of Henry Phipps institute, Seventh and Lombard streets, Philadelphia, is preparing plans and will soon take bids for reconditioning and constructing 40 x 40-foot power house addition. Cost $125,000.

Ohio

BELLEVUE, O.—Gypsum Canning Co., A. C. Domrose, superintendent, is taking informal bids for rebuilding canning plant recently destroyed by fire. Cost to exceed $40,000. New equipment, including transmission and conveying machinery will be purchased and installed. (Noted June 13.)

CADIZ, O.—Ohio-Pennsylvania Coal Co. plans to purchase and install mechanical loading machinery and equipment at its coal mining properties near here.

CLEVELAND — McGean Chemical Co. has awarded contract to Sam W. Emerson Co. for alterations and improvements to its plant at 2910 Harvard avenue.

COLUMBUS, O.—Kirk Grocery Co. will soon ask bids on general contract for two-story addition to bulk storage and distributing plant. Cost about $50,000 with mechanical handling equipment.

MIDDLETOWN, O.—City, W. Brown, manager, is considering making survey for new municipal electric power plant, costing approximately $2,500,000.

Michigan

DETROIT—Sisters of Mercy, care of Richard H. Marr, 415 Brainard street, architect, plans central heating plant in new multi-story nurses home at Pontiac, Mich. Cost about $400,000.

DETROIT—National Products & Engineering Corp., 2470 East Ninety-third street, has been formed to engage in general manufacturing by James F. Randa, 3294 East 104th street, Cleveland.

DETROIT—Marshall Heating & Piping Co., 500 Erie street, has been incorporated with $50,000 capital by Harry M. Scoonover, 17053 Winthrop avenue, to manufacture electric equipment.

DETROIT—National Motor Co. Inc., 2661-7 East Grand boulevard, has been incorporated to engage in manufacturing, by Morris Brose, 9360 Genesee street.

EATON RAPIDS, MICH.—Tri-county Electric Co-operative plans erecting power plant. Cost $75,000.

MUSKEGON, MICH.—Old Dutch Refinery Co. has tentative plans for spending $200,000 before fall to enlarge its refinery. Plans are dependent upon certain financial reorganization of the company.

Builds a New Plant

Willson Products Inc., Reading, Pa., manufacturer of goggles, helmets and respiratory protective devices for dust hazards, has completed a $500,000 expansion program. The enlarged five-story factory contains floor space in excess of 110,000 square feet. Recent developments include a wide selection of goggles and helmets, including the development of Super-Tough lenses, and eight dust respirators, all of which have been approved by the bureau of mines.

Illinois

CHICAGO—R. R. Donnelly & Sons, 350 East Cermak road, plans addition to plant. Cost $500,000 or more. Site has been acquired.

JOLIET, ILL.—Pioneer Brewing Co., Summit street will build a one-story mechanical bottling unit, costing close to $40,000, including equipment.

Indiana

BARGERSVILLE, IND.—Town council will soon take bids for one 75,000-gallon elevated steel tank and tower, deep well pumping machinery and accessories and other equipment for waterworks. John W. Moore & Son, Indiana Pythian building, Indianapolis, consulting engineers.

INDIANAPOLIS — Board of public works, City Hall, has asked bids on general contract for new hangar and one-story mechanical shop adjoining. Cost about $70,000 with equipment.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will take bids until 10 a. m., July 5, schedule 3768, bar steel; schedule 3773, plate steel; schedule 3787, motor-driven centrifugal pumps; schedule 3799, corrosion resisting steel, delivery Philadelphia.

Kentucky

LEXINGTON, KY.—Lexington Water Co. plans installing steam turbines, generators, motor turbine pumping machinery, filtration apparatus, purification machinery and other equipment in connection with expansion in waterworks. Cost $250,000.

Florida

HOMESTEAD, FLA.—City council is arranging financing through federal aid for extensions and improvements in municipal electric light and power plant, including 700-kilowatt diesel engine generating unit and auxiliaries. William Sydow, 3461 Main Highway, Miami, Fla., consulting engineer.

Georgia

ATLANTA, GA.—Atlanta subsidiary of Bauer Pottery Co., Los Angeles, has acquired a building, 1800 Murphy avenue, Southwest, here, for manufacture of pottery in various colors. Extensive alterations and additions are planned. W. E. Bockman is head.

NEWNAN, GA.—J. A. Beavers & Associates, have let general contract to Roger, Pate & Co., Newnan, for one-story meat packing plant, costing approximately $55,000 with equipment.

North Carolina

FAYETTEVILLE, N. C.—Pepsi-Cola Co., R. B. Minges, head, has let general contract to Dixon Construction Co., Fayetteville, for one-story mechanical-bottling plant. Cost close to $50,000 with equipment.

FAYETTEVILLE, N. C. — Brockwell Operating Co., 1005 Buchanan boulevard, Durham, N. C., S. B. Brockwell, president, plans installing pumping equipment, steel storage tanks, pipe lines and other facilities at new oil and gasoline storage terminal on river front, near Fayetteville.

GASTONIA, N. C. — Gastonia Full Fashioned Hosiery Mills Inc. will install an air conditioning system in new local mill. Cost $60,000. H. V. Biberstein,

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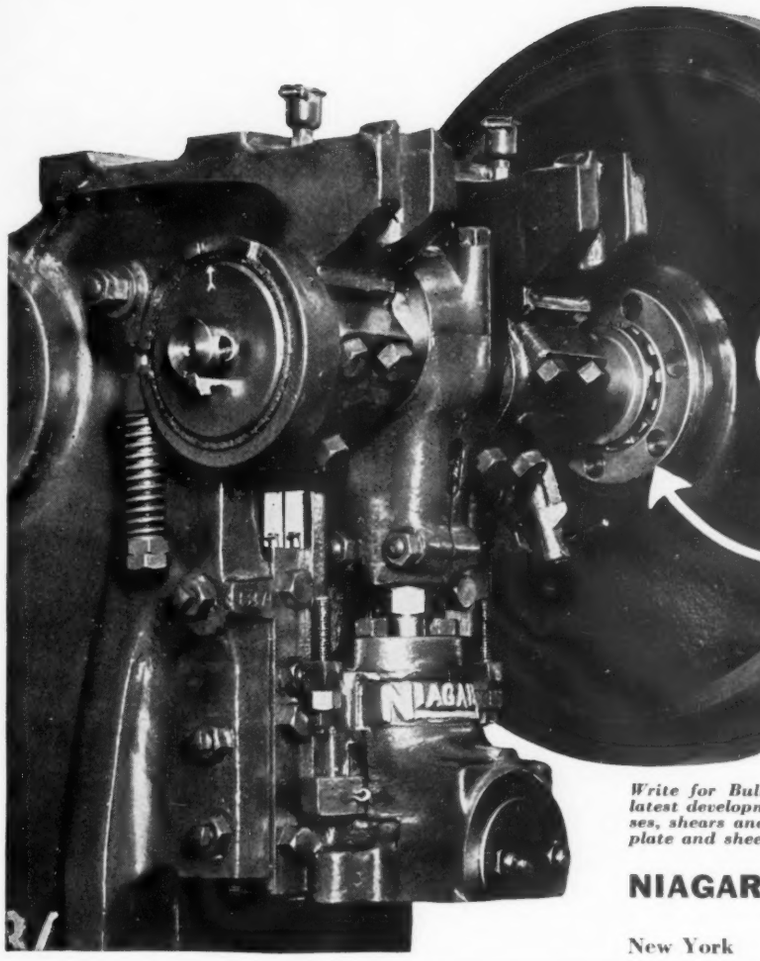

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1600 Elizabeth avenue, Charlotte, N. C., architect and engineer.

HENDERSONVILLE, N. C.—Skyland Packing Co., H. G. Carlisle, head, plans boiler house at new local food canning and packing plant. Cost $50,000.

Louisiana

NEW ORLEANS—United States Engineer office, first district, will take bids until July 8, circular 325, for one five-ton gas engine crawler-type crane.

NEW ORLEANS—J. Aron & Co., 416 Poydras street, has awarded contract to Mosher Steel Co., 5101 Maple street, Dallas, Tex., for structural steel for rebuilding Supreme Sugar refinery, near Labadie, La. New unit will include power house, machine shop and other mechanical departments. Estimated cost $500,000. Leo S. Weil and Walter B. Moses, 427 South Peters street, New Orleans, are consulting engineers. (Noted June 6).

Virginia

RICHMOND, VA.—American Refrigeration Co. Inc., Fifteenth and Cary streets, will take bids until July 1 on general contract for new four-story cold storage and food products freezing plant. Installation will include a 50-ton refrigerating plant, conveyors, loaders and other mechanical handling equipment. Cost over $500,000 including machinery. (Noted June 20).

Missouri

JOPLIN, MO.—Hires Bottling Co. is taking bids on general contract for two-story bottling, storage and distributing plant. Cost over $50,000 including equipment.

SPRINGFIELD, MO. — City, William Lohmeyer, utilities commissioner, has selected Black & Veatch, 4706 Broadway, Kansas City Mo., to prepare plans for additions to its southwest sewage disposal plant, including new digester, sludge system, settling basin and remodeling, to cost about $500,000.

ST. LOUIS—Steel Sales Corp. has begun operations on a new warehouse here which with full equipment will cost $150,000. C. H. Roper is branch manager.

Arkansas

YELLVILLE, ARK.—F. E. Hatch, Little Rock, Ark., has submitted to Yellville chamber of commerce and Ozark Mine Owners league, a proposal for establishment of an electrolytic zinc and lead smelter in the Ozark mining district. Proposed plant would be of 100 tons maximum daily output of refined metal in five units of 20 tons each.

Oklahoma

LINDSAY, OKLA.—City has preliminary plans for constructing addition to light plant, costing about $30,000. G. Alkire, mayor.

PONCA CITY, OKLA.—Continental Oil Co. will install compressors, pumping machinery, steel storage tanks and other equipment in new casinghead gasoline plant in K-M-A oil field district, Wichita county, Texas. Welded steel pipe line will be built for gas transmission to plant, with booster station. Cost $200,000.

Wisconsin

MADISON, WIS.—State highway commission closes bids July 7 on revised plans for two-story highway laboratory and sign shop, 65 x 148 feet. First bids rejected. E. L. Roettiger is state highway engineer.

OSHKOSH, WIS.—County board has accepted low bid of Fluor Bros. Construction Co., local, for building new highway garage and equipment storage warehouse, 80 x 200 feet, costing about $50,000 completely equipped.

Minnesota

LA CRESCENT, MINN.—City, Edward Hurley, recorder, is preparing preliminary plans and will seek WPA aid in constructing sewage disposal system. Frank J. Davy & Son, 1611 Main street, LaCrosse, Wis., consulting engineer.

MINNEAPOLIS—Gamble-Skogmo Inc., chain store grocer, has leased former plant of Triangle Truck Co., St. Johns, Mich., and will improve for new bulk storage and distributing plant. Loading, conveying and other mechanical handling facilities will be installed.

Texas

HOUSTON, TEX.—B. K. Smith, 1701 Milford street, manager of Big Three Welding & Equipment Co., M. & M. building, plans erection of $40,000 plant.

HOUSTON, TEX.—Pacific Valve & Repair Co., Long Beach, Calif., has acquired 20,000 square feet of land here and will start construction immediately of $110,000 plant, 60 x 100 feet, to manufacture valves. Sam D. Cook, 3769 Farbar street, is contractor.

Kansas

NEODESHA, KANS.—City will apply to PWA for grant to install new 1500-horsepower turbine and improve building at power plant at cost of about $150,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

OTTAWA, KANS.—City will apply to PWA for funds to install new 4000-kilowatt turbine and two boilers at power plant at cost of $150,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

QUENEMO, KANS.—City, John Logan, clerk, will hold an election July 1 on $19,000 bond issue for waterworks and $14,000 for sewers. Construction includes 60,000-gallon storage tank. Engineering Service Co., 113 Railway Exchange building, Kansas City, Mo., consulting engineer.

WATERVILLE, KANS. — City, A. F. Geyer, mayor, has filed application with PWA for funds to finance improvement of municipal power plant to cost $29,150. Paulette & Wilson, 311 Farmers Union building, Salina, Kans., consulting engineers.

WELLINGTON, KANS. — City, E. W. Merrifield, superintendent, has filed application with PWA for grant to install two new boilers and construct building at power plant and a 2,000,000-gallon addition to filter plant to cost $201,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

Nebraska

LINCOLN, NEBR.—Eastern Nebraska Public Power district, George W. Kline, secretary, 522 First National Bank building, has filed application with the state railway commission to construct 484 miles of rural transmission lines. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, Nebr., consulting engineer.

Iowa

AMES, IOWA—State board of control, M. R. Pierson, secretary, State house, Des Moines, Iowa, is contemplating installation of new heating equipment at Iowa State college at cost of about $250,000.

ESTHERVILLE, IOWA—City, George Shadle, clerk, has filed application with PWA for grant to construct water softening and filtration plant. Green Engineering Co., 417 First avenue, Southeast, Cedar Rapids, Iowa, consulting engineer.

HAMPTON, IOWA—City council has authorized expenditure of about $15,000 for new city electric plant equipment.

WATERLOO, IOWA—Rath Packing Co., meat packer, is asking bids on general contract for four-story addition, 62 x 242 feet, to cost over $100,000 with equipment. John S. Bartley is company architect.

Pacific Coast

LOS ANGELES—Globe Pipe & Fitting Co., 5631 East Randolph street, has obtained permission to conduct business under that firm name.

LOS ANGELES—A certificate to conduct business under the firm name of Universal Oil Well Equipment Co., at 1785 South Shenandoah street, has been issued to Alfred E. Paulson, owner.

LOS ANGELES—Certificate to conduct business under the firm name of Western Alloy Steel Co., at 1919 Santa Fe avenue, has been issued to the owner, Harry S. Handfuss, 1847 West Drive, San Marino, Calif.

SAN FRANCISCO—State procurement office, United States treasury department, 49 Fourth street, is taking bids on two heavy duty centrifugal pumps, capacity 10,000 gallons per hour. Invitation 5535, f.o.b. Hall of Justice.

PORTLAND, OREG.—Portex Oil Co. will install compressors, pumping machinery, boiler house equipment at new natural gasoline plant near Logansport, La. A welded steel pipe line will be built. Cost $150,000.

HOQUIAM, WASH. — Grays Harbor, Wash., businessmen plan a $200,000 manganese reduction plant at Neilton, daily capacity 250 tons. Local men interested include: R. J. Ultican, W. A. Rupp and T. B. Bruener. Electric furnaces and modern equipment will be installed if application for a $100,000 RCA loan is granted.

NORTHPORT, WASH.—Columbia River Smelters Co. Inc., recently organized, plans construction of smelter here, with daily capacity of 250 tons. Plant will require $30,000 equipment. Fred G. Barnes is president.

SHELTON, WASH.—Shelton Meat & Ice Co. plans refrigerating plant and system in new one-story addition, on which work will begin soon. Cost $30,000 with equipment. Arthur Barton is engineer.

Canada

HALIFAX, N. S.—Nova Scotia Power commission, H. S. Johnston, chief engineer, Provincial building, is constructing diesel electric power plant at Isle Madame. Cost $40,000. All machinery, materials and equipment to be purchased by owner.

SAULT STE. MARIE, ONT.—Algoma Steel Corp. Ltd. is making plans and will soon take bids for tin plate mill, 30,000 to 40,000-ton capacity, ball forging mill and oil storage tanks. Cost $2,000,000.

TORONTO, ONT.—British American Oil Co. Ltd., F. A. Gaby, general manager, Royal Bank building, plans erecting an oil refinery at Okotoks, Alberta, and one at High River, Alberta, each to cost about $1,000,000.

MONTREAL, QUE.—Consolidated Mining & Smelting Co. Ltd., 215 St. James street, West, is making plans for constructing hydroelectric development on Knife river. Initial cost $250,000.

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Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Turret Lathe Tools

The Warner & Swasey Co.—182 page, wire-bound, pocket size catalog and handbook No. 38. All types of lathe tools are pictured and described. The data section contains 20 pages of valuable lathe and lathe tool information. Complete cross-indexing makes this book doubly valuable.

(2)—Air Heaters

J. O. Ross Engineering Corp.—16 page bulletin No. 122. Describes design and operation of Ross-Harrison indirect gas or oil fired air heater systems. Graphs and cutaway illustrations of heaters give visual evidence of this system's efficiency. Outline drawings and dimensions of units complete the book.

(3)—Power Factor Regulator

The Electric Controller & Mfg. Co. —24 page illustrated book No. 158, "We Raised Our Power Factor and Saved $900 a Year." An actual case study showing how taking advantage of a premium clause in power company rules saved $900. Savings represented 22.5 per cent on $4000 investment. Steel readers may have one copy gratis, additional copies 25c.

(4)—Induction Motors

Century Electric Co. — Automatic start induction polyphase motors are illustrated and described in detail in a 2 color, 4 page bulletin, No. 1066. Information on construction and operating characteristics is given.

(5)—Steel Hardening

Ajax Electric Co.—"The Electrode Salt Bath for Hardening High Speed Steel" is the title of a 12 page reprint from the Transactions of the American Society for Metals, being distributed by this company. Axel Hultgren the author, describes the factors that cause decarburization, oxidation and burning of high speed steel tools. Photomicrographs, charts and drawings illustrate his findings.

(6)—Bakelite

Bakelite Corp.—48 page illustrated booklet "Bakelite Laminated." Discusses individual physical, electrical and mechanical properties of laminated sheets, tubes and rods. Directions for working Bakelite laminated are given in detail.

(7)—Storage Batteries

The Electric Storage Battery Co.—8 page, 2 color booklet "In Selecting Any Motive Power Battery, Be Sure—." Cross-sectional views, operating photographs and reproductions of battery service records provide evidence of performance.

(8)—Springs and Wire Forms

M. D. Hubbard Spring Co.—21 page, loose-leaf catalog and stock list of springs, wire forms, stampings, washers, cotter pins and expansion plugs. Dimensional drawings and complete specifications are given for hundreds of standard and special forms.

(9)—Hoists

Shepard Niles Crane & Hoist Corp. —14 page, 2 color illustrated bulletin No. 126. Illustrates and describes design and construction of electric hoists and the antifriction bearing Liftabout. Cross-sectional pictures of construction details and numerous tables and engineering data are presented.

(10)—Ampco Metal

Ampco Metal Inc.—32 page catalog No. 21. Covers scores of applications for Ampco metal. Illustrations of steps in its processing, semi-finished and finished parts, and microphotographs of grain structures amplify the text and specification tables.

(11)—Springs

Raymond Manufacturing Co.—32 page illustrated book "Spring Principles and Design." Gives spring information for quick reference to purchasing agents, draftsmen and design engineers. Shows various styles and kinds of coil springs, flat springs, and small metal stampings. Practical information on design, selection of materials and finish completes the book.

(12)—Coprtex

Armstrong Cork Products Co.—4 page, 2 color bulletin on Coprtex high temperature block and heat insulating cement. Physical properties, insulating properties and complete information on sizes and weights are given. A thermal conductivity chart of Coprtex block is included.

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HELPFUL LITERATURE

(13)—Instruments

The Lewis Engineering Co.—Loose-leaf catalog describes equipment furnished the automotive industry for temperature test experiments. Certain industrial applications for the type of instruments described have also been developed. The catalog, in addition to describing potentiometers, pyrometers, resistance thermometers, selector switches, thermocouples, protection tubes and accessory equipment, gives a complete price list of instruments and parts.

(14)—Roll Grinder

Farrel-Birmingham Co., Inc.—28 page bulletin No. 111, "Farrel Heavy Duty Roll Grinder." Details of construction, operation and floor plan, together with general specifications, dimensions and weights are given. Six standard sizes from 24 inch to 60 inch, in lengths up to 26 feet between centers are available. Complete list of products completes this booklet.

(15)—High Speed Steels

The Cleveland Twist Drill Co.—Third Edition of 40 page booklet on Mo-Max, molybdenum-tungsten high speed steels. A descriptive treatise including tables of analyses and microphotographs of grain structures. A list of licensees is included.

(16)—Steel Chairs

The Harter Corp.—16 page folder "Posture Seating by Harter" illustrates 15 styles of scientifically designed steel chairs. Complete descriptions of types for executives, typewriter and work bench are included.

(17)—Xaloy

Wilcox-Rich, Div. of Eaton Mfg. Co.—"Hard Facts" is a monthly bulletin. The March issue shows numerous applications of Xaloy, a ferrous alloy with unusually hard surface.

(18)—Springs

Lee Spring Co., Inc.—"Lee-Spring Builder" is the title of an interesting bulletin containing considerable technical information on the proper design of springs of all types. The factors of stability, accuracy and endurance are discussed in arriving at proper spring design. The discussion covers compression, extension torsion or clock type; and flat and wire form springs.

(19)—Speed Changer

Allis-Chalmers Mfg. Co.—12 page, 2 color bulletin 1266 "New Horizons." Describes new totally enclosed varipitch speed changer with double extension shafts. Wide flexibility of layouts in installation, and installation pictures together with general dimensions, speed range and horsepower ratings are given.

(20)—Sleeve Type Bearings

Johnson Bronze Co.—64 page illustrated catalog 380. Complete information on bronze bearings, bronze bushings, universal bronze bars, electric motor bearings, babbitt and graphited bronze bearings. Simplified thumb-indexing makes reference to sections easy.

(21)—Needle Bearings

The Torrington Co.—12 page catalog No. 15. Gives complete information on five types of needle bearings. Design, lubrication, capacities and use under varying conditions are discussed. Specifications and tolerences, rated load capacity and a price list complete the catalog.

(22)—Pot Furnaces

Surface Combustion.—4 page, 2 color bulletin on standard rated pot furnaces for heat treating, drying and annealing, and forging. Installation photographs and operating data are included.

(23)—Fans

South Bend Air Products, Inc. — Catalog No. 1-A is a 16 page, well illustrated presentation of Dynaflow and Aerospot ventilating equipment. The principle of the unique fan blade design is illustrated. Tables give operating characteristics of various sizes. The last three pages are devoted to valuable tables on ventilation information, friction losses and areas, and circumference of circles and squares.

(24)—Machine Tool Drives

Cullman Wheel Co.—This 8 page, 2 color folder shows various applications of the Cullman Drive, an individual electric motor unit designed to eliminate countershaft and overhead belting arrangements, but providing belt drive smoothness. List prices for lathe, shaper, milling machine and punch press drives are given.

(25)—Arc Welding

Harnischfeger Corp.—10 page bulletin No. W20 entitled "New Advances in Arc Welding Equipment Design." It presents an outline of the modern goal in arc welding equipment design and welding technique. Charts, graphs, line drawings, photographs and photomicrographs illustrate product, methods and results.

(26)—Power Shovel

American Hoist & Derrick Co. — Catalog GF 3 presents almost a hundred striking illustrations of the model 350 half-yard American Gopher shovel, in 24 pages of interesting information. In addition to installation photographs, complete structural details and specifications for its use as a shovel, clam shell or dragline are given.

(27)—Cranes

Industrial Brownhoist Corp.—12 page, 2 color booklet No. 371, "Marching On With Industry." Seven types of diesel and gasoline cranes, ranging from 10 to 50 tons capacity, are pictured and described. General specifications are shown in table form. Construction details are pictured.

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(1)—Springs and Wire Forms

Wickwire Spencer Steel Co.—"A Treatise on Springs, Wire Forms and Spring Wires," is the title of a 48 page book covering many technical and design problems. The index lists 86 factors of importance in spring design, each of which is discussed at length. Valuable tables complete the book.

(2)—Railing Posts

The Lake City Malleable Co.—This bulletin on a new line of "shock proof" malleable railing posts for guard railings gives complete information on various sizes and specifications available. The one piece, rust resisting malleable posts are built for either two or three rails. Special sizes and designs are available.

(3)—Sheet Lifter

Cullen-Friestedt Co.—6 page illustrated bulletin SL-14 shows the C-F Sheet Lifter in actual use under various conditions. Damage elimination, increased storage capacity, safety, infinite adjustment and fast, positive control are shown to be outstanding features.

(4)—Cutting Oil

D. A. Stuart Oil Co., Ltd.—"The Story of Sulphurized Cutting Oils" is told in this 52 page profusely illustrated booklet. Various types of oils are discussed together with recommendations for their use.

(5)—Speed Nuts

Tinnerman Stove and Range Co.—6 page bulletin on the Speed Nut System, illustrating and describing application of 24 of the more than 250 types of speed nuts. A new system for applying in inaccessible places is described. Typical production applications are also showin.

(6)—Gas Scrubbers

Peabody Engineering Corp.—Bulletin No. H-101 shows cross sectional diagramatic views of the new Peabody gas scrubber. This new scrubber for dust and fume removal, humidification, cooling material recovery, absorption and chemical reaction incorporates new scrubber principles. It applies the same natural law which accounts for the fact that every drop of rain falling contains a particle of dust. Water formed by condensation of water vapor in the air is deposited on the dust particles as nuclei thus increasing their mass until they drop by their own weight.

(7)—Arc Welding

Harnischfeger Corp. — "The Arc Welding of Tomorrow" is the title of this 18 page 2-color bulletin describing the Smootharc P & H-Hansen welder. Shop type and portable units are described and illustrated with photographs. A cross-sectional view of the unit shows simplicity and ruggedness of design.

(8)—Industrial Trucks

Automatic Transportation Co.—Illustrated loose-leaf catalog covering all types of industrial trucks. Construction details, operating data and installation photos provide complete information. Catalog will be prepared to suit needs of specific industry.

(9)—Steel

Joseph T. Ryerson & Son, Inc.—28 page book "Ryerson Certified Steels," showing in graphic illustrations and text this company's newly announced plan of certifying steels. Explanation of laboratory control, marking systems and distribution, together with facsimile data sheets covering typical analysis and suggestions for the heat treater complete the book.

(10—Milling Machine Practice

The Cincinnati Milling Machine Co.—16 page reprint of the revised chapter on milling machine practice from Kent's Handbook, as prepared by Hans Ernst of this company and Mario Martellotti, Research Engineer. A comprehensive technical discussion of the subject.

(11)—Cap Screws

The Cleveland Cap Screw Co.—16 page filable booklet on Kaufman Process, full finished cap screws. Full specifications on sizes, threading and prices are included.

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(12)—Malleable Iron Castings

Jamestown Malleable Iron Corp.—This four page bulletin describes various steps in the manufacture of malleable iron castings by this company. One feature of their service is use of continuous annealing, reducing annealing time from 7 days to 31 hours, and producing scale free castings that are not subject to rim or skin troubles. Chemical and physical control of metal at 30 minute intervals is featured.

(13)—Extrusion Press

Beatty Machine & Mfg. Co.—8 page bulletin No. 100-H.E.P. describes new motor driven hydraulic extrusion presses for coating welding electrodes. Specifications on three sizes are given, together with lists of Beatty products users, user's comments and a list of Beatty machines.

(14)—High Speed Steel

A. Milne & Co.—"Made From Milne High Speed Steels" is the title of a bulletin describing this line of high speed steels. A color bar code wall chart giving temperatures for proper heat treatment and identification of the more popular grades is also available.

(15)—Face Milling Cutters

Ex-Cell-O Corp.—"Simple as A. B. C." is the title of Catalog No. M-338, showing advantages and construction of Continental Face Milling Cutters. Simplicity of locking, unlocking and adjustment are claimed for this unit. A complete table of prices is included.

(16)—A-C Motors

Crocker-Wheeler Electric Mfg. Co.—This 8 page bulletin No. 251 describes a new alternating-current polyspeed motor. Applications, construction, speed regulation and operation are described. Positive speed regulation over a wide range is claimed for this unit.

(17)—Flooring

Belmont Iron Works—This 24 page booklet gives design and structural details of a new rolled, structural steel, interlocking channel floor for highway and railway bridges, pier decks and modern building flooring. Numerous specification tables provide complete engineering data.

(18)—Heat Treating

American Gas Furnace Co.—16 page booklet showing and describing equipment and installation photographs of gas carburizing, clean hardening, clean annealing, normalizing, nitriding and "Ni-Carbing" furnaces and machines. "Ni-Carbing" is a new gas surface hardening process covered in detail.

(19)—Welding Electrodes

Metal & Thermit Corp.—16 different types of Murex heavy coated electrodes are described in this 32 page Booklet No. 3. Physical properties, chemical analysis and recommended use of each type is given. Current requirements and weights complete this booklet.

(20)—Forgings

Drop Forging Assn.—4 page illustrated bulletin cites examples of mechanical strength of forgings, without unnecessary dead weight. "Drop Forging Topics," a monthly publication, is also offered users of machine parts.

(21)—Storage Equipment

The Frick-Gallagher Mfg. Co.—This bulletin shows numerous applications of the "Rotabin" in stock and tool rooms. Dimensional photographs and complete descriptions accompany each type shown.

(22)—Galvanizing

American Hot Dip Galvanizers Assn. Inc.—Specification sheet and data on hot dip galvanizing. Filable bulletin with insert showing list of qualified members of the association.

(23)—Refractory

Quigley Co., Inc.—Form No. 328 on "Insulbrix" has just been published. In eight pages of installation photographs, tables of characteristics, and general discussion, these light weight, low heat storage, insulating fire brick are presented. The important advantages of Insulbrix are claimed to be fuel saving, time and labor saving, increased production, higher efficiency and lower operating costs.

(24)—Air Compressors, Hoists

Curtis Pneumatic Machinery Co.—"How Air Is Being Used in Your Industry" is the title of Booklet C-60, which is a compilation of applications for air compressors and air operated equipment in 45 industries. Photographs show typical applications.

(25)—Welding Fume Collector

Ruemelin Mfg. Co.—Bulletin 37 illustrates and describes the new Ruemelin welding fume collector for fumes, smoke and dust created in electric welding operations. Details of construction, movement, range, power consumption and installation are given.

(26)—Industrial Ovens

J. O. Ross Engineering Corp.—16 page booklet describing oven construction, method of heating and material handling in Ross industrial ovens. Methods of determining proper procedure and results obtained are covered. Numerous illustrations and drawings illustrate the text.

(27)—Pole Loading

Acme Steel Co.—The Acme Unit-Load System, approved by the Loading Rules Committee of the A. A. R., for economical loading and fastening poles in shipment, is described in this new 8 page, illustrated booklet "Bound To Get There."

(28)—Welding

S. Morgan Smith Co.—Bulletin No. 134, "Welding by Smith," describes a new welding service available to industry. Pictured are numerous unusual welding jobs acomplished in this plant, for various manufacturers.

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Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Materials Handling

Mathews Conveyer Co.—32 page booklet "Equipping Industry For Continuous Production." Pictorial presentation of entire line of materials handling equipment. Applications of various types of conveyers in numerous industries are shown.

(2)—Steel

Joseph T. Ryerson & Son. Inc.—224 page 1938 stocklist. Explains new plan of certifying steel and contains thousands of steel items available from stock. Conveniently thumb indexed for ready reference.

(3)—Riveter

The Tomkins-Johnson Co.—4 page bulletin No. R-3. Describes the new "Rivitor," capable of setting 1500 solid rivets an hour. Direct driven, automatic feed, non-repeating unit reduces production costs. Specifications of the "R" machine are given.

(4)—Starter

Allen-Bradley Co.—Bulletin 740 and price sheet. Automatic resistance starters with polyphase rating from 5 to 250 horsepower for 110, 220, 440 and 550 volts, in standard or dust tight cabinets are described. "Bradleyunit" resistors are a feature of these starters.

(5)—Machine Tools

Ex-Cell-O Corp.—8 page 2 color bulletin "Tool Tips." Illustrates and briefly describes Ex-Cell-O precision products. A complete list of representatives is given.

(6)—Crane Wheels

Farrell-Cheek Steel Foundry Co.—Bulletin No. 5-35 illustrates and describes Farrell's "85" cast crane wheels. Reasons for the superiority claimed for these crane wheels are given in detail. In addition, a list of more than 80 industrial products that can be made of Farrell's "85" wear resisting cast steel is given.

(7)—Speed Reducers

Stephens-Adamson Mfg. Co.—12 page catalog No. 68. The JFS variable reducer transmission is illustrated and described. Cross-sectional views and operating pictures together with tables of speed ranges and horse power transmitted complete the book.

(8)—Packaging

Signode Steel Strapping Co.—Fifth edition of a booklet designed to show ways and means of preparing and shipping a wide variety of commodities economically. Typical savings are narrated. Among the hundred or more illustrations are some showing typical methods of bulk binding shipments in steel and metalworking industries.

(9)—Forgings

The Champion Machine & Forging Co.—8 page, 2 color bulletin. A wide variety of drop forgings are illustrated. Laboratory and plant pictures show facilities for making forgings of all types.

(10)—Pumps

Vickers Inc.—6 page 2 color bulletin 37-2. Reproductions of actual performance curves, blueprints of 6 types, and sectional view, together with performance data, provide complete information on vane type constant delivery rotary pumps in capacities of 2, 3, 5, 8 and 11 G. P. M.

(11)—Tramrails

The Cleveland Crane & Engineering Co.—4 page, 2 color bulletin, G2-38. Shows numerous applications of Cleveland Tramrail overhead materials handling systems in industry. Hand and motor operated systems for loads up to 5 tons are pictured.

(12)—Flow Meters

The Brown Instrument Co.—3 color bulletin No. 80-36. Explains how flow meters metering steam, water, oil and other fluids, can bring to manufacturing processes many economies they have effected in power production.

(13)—Gages

Detroit Tap & Tool Co.—4 page folder. Crobalt threading plug gages are said to outlast gages of ordinary metal. A complete price list on standard sizes is shown.

(14)—Motors

Allis-Chalmers Mfg. Co.—4 page, 2 color leaflet 2182-A. Seal-Clad, protected winding motors are described and shown in actual use. Construction features are shown in detail.

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(15)—Cranes

Cullen-Friestedt Co.—4 page, 2 color bulletin F-91. Models 15 and 30 Burro cranes are shown in numerous industrial applications. Specifications and descriptions complete the bulletin.

(16)—Locking Rivet

Hopkan Rivet Co., Inc.—2 color bulletin describes design and use of new kind of locking rivet applied with pliers. Particularly applicable whereever confined spaces, fragile materials, heating, hammering or upsetting is impractical. Many applications are shown.

(17)—Grinding Machines

Cincinnati Milling Machine & Cincinnati Grinders Inc.—28 page booklet G-410. Describes design and construction of, and production on 6 inch and 10 inch plain hydraulic grinding machines. Complete specifications and a list of agents are included.

(18)—Motor Starters

Westinghouse Electric & Mfg. Co.—8 page, 2 color bulletin B-2118. Protection against explosion and corrosion with "De-Ion" oil immersed motor starters is illustrated and described in detail. Keyed photographs show working parts of unit.

(19)—Monorail Systems

American Monorail Co.—24 page booklet. The MonoTractor, incorporating a pneumatic tire driven by electric motor through a speed reducer, is described in detail. Many operating pictures are shown. Manually operated systems are also covered.

(20)—Welding

General Electric Co.—12 page, 2 color bulletin GEA-2704. Describes complete line of arc-welding accessories. Price list of various items accompanies descriptions.

(21)—Furnaces

Pittsburgh Lectromelt Furnace Corp.—48 page book: Full color illustrations and shop views together with tabular data emphasize the story behind Lectromelt furnaces. This is a general catalog discussing the more standard sizes of furnaces in order of increasing capacity.

(22)—Lathes

R. K. LeBlond Machine Tool Co.—16 page, 3 color bulletin No. 11-19 R.P. 438. 4-way rapid production lathes are designed for rush production work and are thoroughly described. Automatic controls and other attachments are pictured and described.

(23)—Gears

Cloyes Gear Works.—16 page catalog No. 4138. Complete list of metal and noiseless timing gears for all models and makes of automobiles, trucks and internal combustion engines from 1915 to the present. A list of distributors and representatives is given.

(24)—Air Drills

The Cleveland Pneumatic Tool Co.—12 page, 2 color bulletin 83. Describes and illustrates numerous drills and air tools, for drilling, reaming, tapping, nut setting and screw driving. Numerous "on the job" illustrations are shown.

(25)—Locomotive Cranes

The Browning Crane & Shovel Co.—Bulletin 537 pictures and describes construction details of the Browning M-1, 30 to 40 ton and N-1, 35 to 50 ton, diesel, gasoline and electric locomotive cranes. Lifting capacities are given.

(26)—Valves

C. B. Hunt & Son—98 page, illustrated loose-leaf book. Covers construction, specifications and use of air and hydraulic control valves. Complete price list is included.

(27)—Steam-Jet Ejectors

Ingersoll-Rand Co.—28 page booklet. Illustrates and describes principle and actual operation of steam-jet ejectors for removing air, gases or vapors from condensers and from vacuum chambers in industrial processes. Also describes pumps.

(28)—Benders

Wallace Supplies Mfg. Co.—88 page flexible binding, catalog No. 32. Complete information and data on hydraulic, motor driven and hand operated benders for tubing, solid bars, rolled moldings, extruded sections, structural shapes, pipe and conduit.

(29)—Socket Screws

Parker-Kalon Corp.—8 page, double fold, 2 color booklet. Shows and describes methods of forming and controlling standards of cold forged socket set screws, socket head cap screws and socket head stripper bolts. A list price of standard sizes is included.

(30)—Motors

Century Electric Co.—24 page, 2 color booklet 1039. Presents information concerning electrical characteristics of fractional horse power motors. Suggests how these characteristics can be most effectively applied to motor driven machinery and appliances.

(31)—Air Hoists and Cylinders

Curtis Pneumatic Machy. Co.—14 page, 2 color bulletin A-4. Shows Curtis air hoists, cylinders and valves in actual operation. Cross sectional pictures and blue prints, together with tables give complete specifications.

(32)—Spray Nozzles

Chain Belt Co.—4 page, 3 color bulletin No. 302. Describes Rex nonclogging flat spray nozzles for all types of industrial washing and cleaning. Uniform distribution and hard-hitting spray are features of these units.

(33)—Presses

Hannifin Mfg. Co.—58 page, wire bound bulletin No. 41. Illustrates and describes complete line of air and hydraulic presses for all types of work. Control valves, chucks and cylinders are also covered.

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(1)—Insulation

Johns-Manville—32 page, illustrated booklet IN-55A. Contains specific information on all of the sheet, block and pipe insulations developed by this company. New JM-20 insulating brick for insulating and back-up is covered. Ten pages are devoted to specific recommendations.

(2)—Mechanical Packing

Linear Packing & Rubber Co., Inc. —112 page, 2 color, case-bound book. Presents complete line of asbestos, flax, duck and rubber, semi-metallic, and plastic packings. One section is devoted to recommendations of packings for specific uses. Sheets, gaskets and miscellaneous materials are included.

(3)—Drilling & Tapping Machines

Edlund Machinery Co., Inc.—8 page bulletin No. 103. Pictures and describes No. 4B and 1A drilling and tapping machines. Complete specifications, motor data and spindle speeds are given.

(4)—Die Castings

The New Jersey Zinc Co.—24 page, illustrated booklet on die castings in the electrical industry. Properties of die cast Zamak alloys are given.

(5)—Welding

Thomson-Gibb Electric Welding Co. —4 page, 2 color monthly bulletin "Flashes." This series of bulletins illustrates and describes ideas and information about production welding.

(6)—Welding Rod

The American Brass Co.—24 page, illustrated booklet No. B-13, eleventh edition. Tobin bronze, phosphor bronze, Everdur, manganese bronze, copper, super-nickel and other alloy welding rods for gas and electric welding are described. A convenient conversion table of melting points and temperature colors of commonly used metals and alloys is included.

(7)—Spout Magnets

Stearns Magnetic Mfg. Co.—4 page, 2 color, illustrated bulletin No. 92-B. Safety trap type, high duty, spout magnetic separators for removing tramp iron from materials in process are described. This type separator requires no generating equipment if A.C. current is available.

(8)—Machine Tools

Baker Brothers, Inc.—36 page, illustrated filable folder. Describing 4 sizes of drilling machines, keyseaters and slotters, contour grinders, and boring, drilling and tapping machines. Full descriptions and specifications are provided.

(9)—Pickle House Equipment

The International Nickel Co., Inc. —24 page, illustrated booklet and 4 page folder. Shows all types of pickle house equipment. Various steps are described and methods of pickling various kinds of parts are covered in detail.

(10)—Refractory Cement

Quigley Co. Inc.—4 page, illustrated bulletin No. 322-B. "Q-Chrome," neutral base refractory cement for furnace construction and maintenance, is described and its characteristics under different conditions are set forth. A complete list of Quigley products is given.

(11)—Air Conditioning

Clarage Fan Co.—36 page, illustrated bulletin No. 107, second edition. Multitherm conditioning units for cooling, dehumidifying, heating, humidifying and cleaning air in industrial plants are described. Tables for determining requirements are given.

(12)—Spray-Finishing

The DeVilbiss Co.—28 page, illustrated catalog No. ID. Covers in condensed form, complete standard spray-finishing equipment for industrial use. Full specifications and prices on all standard items are given.

(13)—Hoists

Harnischfeger Corp.—28 page, 2 color bulletin No. H-5. Hoists for material handling from 15 pounds to 15 tons. Cross-sectional views, complete specifications and clearance data are given.

(14)—Ball Bearings

The Fafnir Bearing Co.—16 page, illustrated publication "The Dragon." Contains articles on manufacture of Fafnir Ball Bearings, industrial applications and a helpful hints department.

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(15)—Cranes

Industrial Brownhoist Corp.—12 page, 2 color, illustrated booklet No. 385. Describes and gives complete specifications of No. 7, 30 ton, No. 5, 25 ton, and No. 4, 20 ton steam locomotive cranes. Operating pictures and structural details complete the booklet.

(16)—Disc Grinding

Norton Co.—28 page, illustrated, pocket-size book. Discusses disk grinding as a production operation, describing various types of disks available and includes tables of recommended wheels for different operations and materials.

(17)—Rail Welding

Metal & Thermit Corp.—36 page, 2 color illustrated booklet 117. Thermit rail welding for continuous railroad rails is pictured in detail. Continuous rail history and applications in the United States and abroad are described.

(18)—Hoists

American Hoist & Derrick Co.—8 page, 2 color, illustrated bulletin No. H.B.3. The new American general purpose, 35-50 H. P. gasoline or electric hoist in single or double drum types is shown. Specifications and on-the-job pictures are included.

(19)—Grinders

Landis Tool Co.—12 page, illustrated catalog No. L-38 3 inch type "C" hydraulic chucking grinder for grinding small parts that cannot be held between centers. Keyed illustrations and complete mechanical specifications are shown.

(20)—Pump Rotors

Farrel-Birmingham Co.—5 pages and 2 blueprints. Technical discussion of use of Sykes continuous tooth herringbone gears as pump rotors. Methods of figuring requirements and blueprints of specifications are shown.

(21)—Bar Benders

Kardong Brothers, Inc.—32 page, 2 color, illustrated booklet. Describes bar benders of all sizes and types for bending reinforcing bars, stirrups, circles and spirals, and spacer punches, wire shears, wire straighteners, column clamps and other special equipment.

(22)—Goggles

American Optical Co.—4 page, 2 color folder TL 107. This eye protection guide in chart form shows at a glance the recommended type of goggles for various hazardous occupations. Various types of goggles are pictured.

(23)—Controllers

The Foxboro Co.—22 page, 2 color illustrated bulletin No. 202-1. Automatic temperature controllers of the indicating, non-recording type, for a temperature range of 300 degrees F. to 2650 degrees F. Full specifications are included.

(24)—Bearings

R. W. Rhoades Metaline Co., Inc.—4 page bulletin on Metaline oilless bronze bearings in outside diameters from three-eighths inch to five and seven-eighths inches. Advantages of these bearings for installation where lubrication is difficult are shown.

(25)—Roller Bearings

Shafer Bearing Corp.—74 page catalog No. 14. Complete descriptive information and data on roller bearings of all sizes and for all purposes is given. 7 pages of engineering data and a complete price list of standard sizes complete the book.

(26)—Steel

Bliss & Laughlin, Inc.—8 page, 2 color folder. Extra wide flats cold drawn, in standard commercial sizes and extra widths are available in a full range of sizes. Characteristics are shown.

(27)—Air Cylinders

Hanna Engineering Worke.—Catalog 226 presents a wealth of technical information concerning air cylinders in 24 pages. Complete dimensional tables and cross sectional drawings describe the various models. Several pages are devoted to hydraulic cylinders, "Unitite" valves and Hanna hoists.

(28)—Compressors

Ingersoll-Rand—24 page, 2 color illustrated booklet No. 3264. Two-stage air-cooled portable compressors with 2 and 4 wheel trailer mountings are described in detail. Complete data for both gasoline-engine and oil-engine driven units is given.

(29)—Refractory Concrete

The Atlas Lumnite Cement Co.—40 page, illustrated loose-leaf book. Describes use of Lumnite Cement for refractory purposes in many applications. A supplement showing use of refractories in numerous specific applications is valuable.

(30)—Sprocket Chain

Peoria Malleable Castings Co.—32 page catalog and price list No. 105. Describes, pictures, and gives specifications of all types of sprocket chain, pintle chain and other malleable iron specialties.

(31)—Die-Making Machines

Grob Brothers—8 page, 2 color bulletin. Open end metal band saws, continuous motion die-filing machines and electric brazers for both light and heavy duty work are shown and described.

(32)—Band Saws

Wells Manufacturing Corp. 2, 2 page descriptive sheets on 2 sizes of horizontal metal band saws and one size combination metal and wood band saw. Complete specifications of each model are given.

(33)—Filing Machine

Continental Machine Specialties, Inc.—4 page, 2 color, illustrated folder. New hand or bench operated continuous filing machine for production filing or job work. Specifications are given.

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(1)—Steel Bars

La Salle Steel Co.—12 page, 3 color booklet No. 30. "Stressproofing," a new method of producing high strength, true engineering steels, is described in detail. Laboratory tests and case studies are quoted to show properties and characteristics of the bars.

(2)—Bench Clincher

The Tomkins-Johnson Co.—4 page, illustrated bulletin No. BC-1. A fully automatic machine controlled by a single foot lever, designed to meet the demands of industry for clinch nuts in production work. Automatically feeds and sets nuts with speed and accuracy. Specifications are given.

(3)—Acid Brick

The Keagler Brick Co.—4 page, 2 color, illustrated bulletin. "Toronto" acid brick are made in standard size and special shapes and are designed especially for use in connection with Basolit, acid proof cement joint. Various shapes and dimensions are given. Floor brick are also covered. A list of industrial users is shown.

(4)—Coal

Appalachian Coals, Inc.—16 page, pocket-size directory. 13 pages are devoted to a list of companies affiliated with Appalachian Coals, Inc., marketing high volatile bituminous coals in more than 20 states. An alphabetical list of producers completes the directory.

(5)—Steel

Alan Wood Steel Co.—46 page book and supplement on "Dyn-el" steel. Provides complete information on new high-strength, flat-rolled steel with unusual resistance to fatigue, impact and corrosion, mechanical characteristics, corrosion properties, fabricating and welding properties are described.

(6)—Industrial Lighting

General Electric Vapor Lamp Co.—12 page, 2 color, illustrated bulletin No. 521. Cooper Hewitt-Incandescent combination type lighting units, said to reproduce daylight conditions, are shown in numerous types of industrial applications. Engineering data, with comprehensive charts and tables are included.

(7)—Pneumatic Riveters

Hannifin Manufacturing Co.—12 page, 2 color, illustrated bulletin No. 43. "Allen" portable and stationary pneumatic riveters in types and sizes for every riveting job are described in detail and pictured. Jaw, alligator, compression and lattice types are shown. Other Hannifin products are also described briefly.

(8)—Furnaces

The Gas Machinery Co.—10 page, loose-leaf catalog. Rotary hearth furnaces with water seal and syphon vents for forging applications involving slagging of product are described and illustrated.

(9)—Centrifugal Pumps

Ingersoll-Rand Co.—16 page, 2 color bulletin No. 7067. New bulletin giving complete specifications and operating characteristics of the Cameron Class GT two-stage centrifugal pumps. Two pages of typical installations are included.

(10)—Electric Motors

Fairbanks, Morse & Co.—8 page, 2 color, illustrated bulletin No. 2260. Direct-current motors in sizes up to 200 H. P., with a variety of mechanical modifications for both high and low voltage operation, and for a wide range of requirements, are presented.

(11)—Cutting Equipment

E. C. Atkins & Co.—156 page, illustrated catalog No. 21, second edition. General catalog of saws, saw tools, machine knives, files and miscellaneous equipment. The new A-Mol hand and power hacksaw blades are shown with list prices.

(12)—Welding Control

Westinghouse Electric & Mfg. Co.—12 page, 2 color bulletin No. B.2123. Describes Ignitron controls for spot, seam, butt and projection welding operations, and for applications requiring a single welder for both spot and seam welding. Suggestions for handling unusual welding jobs needing frequently heat adjustment, or different current and time values are discussed.

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(13)—Pipe Couplings

The Champion Machine & Forging Co.—8 page, 2 color, illustrated bulletin on Champion "77" drop forged pipe couplings. This 5 part coupling is designed for simplicity and rugged service. Specifications, cross-sectional pictures and diagramatic drawings under varying conditions explains its use in detail.

(14)—Gears & Speed Reducers

The Horsburgh & Scott Co.—448 page general catalog No. 37 and price list. Complete pocket-size handbook and catalog on gear speed reducers and gears. Much valuable engineering data accompanies various sections of the book.

(15)—Channel Sections

Youngstown Steel Car Corp.—4 page, illustrated folder. Describes the new "Yocar" die-pressed channels requiring no initial tool expense, no dies to buy, and greater uniformity and flexibility. Methods of manufacture are given in detail.

(16)—Rail Welding

Metal & Thermit Corp.—32 page, 2 color pamphlet 117. Thermit welding of rails, requiring no outside source of energy or heat, is completely described. Advantages and complete data on this method are pictured and discussed.

(17)—Cap Screws

The Chandler Products Corp.—16 page, illustrated booklet. All types of cap screws are shown and price lists are given. Pictures of progressive steps in manufacture and steps in inspection accompany product description.

(18)—Metal Balers

Logemann Brothers Co.—4 page, illustrated bulletin No. 191. Presents several types of heavy duty metal balers. Performance, cycle of operation, installation data and accessory equipment is detailed.

(19)—Pyrometers

Leeds & Northrup Co.—52 page, 3-color, illustrated catalog No. N-33A. Micromax thermocouple pyrometers in various models and styles, are shown and described in detail. Recommended methods of reliably measuring industrial temperatures are covered. Reproductions of records and full specifications complete the book.

(20)—Files

Henry Disston & Sons, Inc.—16 page, pocket-size, looseleaf filler. Selection and care of files is covered in detail, with numerous practical suggestions for work improvement and file economy. Full information on sizes and types of tools for various jobs is given.

(21)—Platform Trucks

The Elwell-Parker Electric Co.—4 page, illustrated bulletin A-8328. Type "E-2" high lift platform trucks with maximum platform height of 114 inches, is described in detail. Various on-the-job pictures are shown.

(22)—Steel Test Data

The Timken Roller Bearing Co.—16 page technical bulletin No. 21. Value of recently developed stress-rupture test in determining high temperature characteristics of various steels is discussed. Diagrams, tables and photomicrographs substantiate the discussion.

(23)—Welding

The Lincoln Electric Co.—2 page, machine design application sheet No. 60, Series 2. Illustrations and discussion of how welded design of machine parts was utilized to replace other methods of forming.

(24)—Steel

The Levinson Steel Co.—10 page stocklist. A complete stocklist of slabs, plates, sheets, checker plates, flats, angles, beams, channels, rounds. squares, tees and deformed bars available for immediate delivery.

(25)—Transmission Equip't

Boston Gear Works, Inc.—320 page, pocket size, illustrated catalog No. 52. Complete line of power transmission equipment is described. Specifications and prices are given. Several pages of valuable engineering data accompany the book.

(26)—Metal Hose & Couplings

Packless Metal Products Corp.—26 page file-folder bulletin No. 100. Contains complete information, application photographs and specifications on seamless flexible metal hose, detachable self-sealing couplings, self-flaring tube couplings and copper tubing.

(27)—Panels

The Hays Corp.—8 page, 2 color, illustrated bulletin No. 37-305. Centralized instrument and control panels and accessories, custom built for all types of installations are described.

(28)—Everdur Metal

The American Brass Co.—8 page bulletin No. E-5, (Eighth Edition). Applications, physical properties, constants and corrosion resistance data of "Everdur" Metal are presented in this discussion which is accompanied by numerous tables.

(29)—Pneumatic Transmission

The Brown Instrument Co.—4 page, 2 color folder No. 94-1. Pneumatic remote transmission system for remote transmission of measurement and control in hazardous atmospheres, where use of electrical transmission is not permissible, is described in detail.

(30)—Pyrometers

Bacharach Industrial Instrument Co. —8 page, illustrated bulletin No. 300. Theory and practical operation of the optical pyrometer are described. Detailed specifications and explanation of applications are included.

(31)—Gas Producer

The C. M. Kemp Mfg. Co.—4 page, 2 color, illustrated bulletin No. 10. The Atmos-Gas Producer, available in various sizes, is pictured and described for use in bright annealing. Specifications are given.

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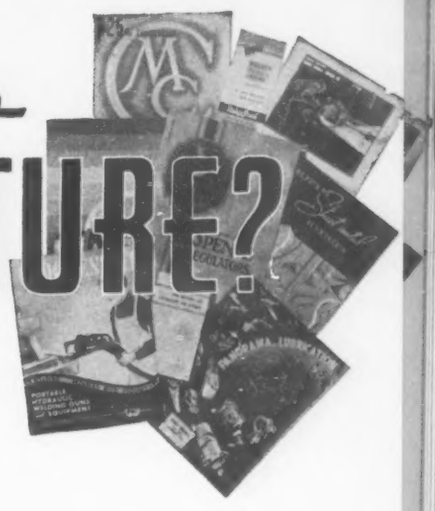

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(1)—Casters and Trucks

Service Caster and Truck Co.—64 page, 3 color catalog No. 38. Complete information on brakes, casters, couplers, dollies, dump trucks, lifters, lift trucks, live skids, trailers, trucks and wheels for indoor industrial service. Full description and illustrations are included.

(2)—Buckets

The Wellman Engineering Co.—40 page, multi-color, illustrated, plastic bound booklet P-3-65. A full line of "Williams" buckets for handling all types of materials under various conditions is completely described. Structural features and operating data is given.

(3)—Pumps

The Ruthman Machinery Co.—8 page, 2 color folder on gusher coolant pumps. Pictures many types of machinery showing in each case the use of pumps as standard equipment. Also pictures various types of pumps describing specific installations.

(4)—Motoreducer

Philadelphia Gear Works.—28 page, 2 color, illustrated bulletin No. MR-36. The Philadelphia Motoreducer, a combined motor and speed reducer for individual drive, is completely described and pictured in industrial applications. Complete specifications are shown in table form.

(5)—Starters

The Electric Controller & Mfg. Co.—2 page illustrated bulletin 1083 with price sheet. Describes complete line of heavy duty, mill type starters for direct current motors which can be adapted from one horsepower rating to another. Starters are built in four sizes, from 5 to 150 H.P.

(6)—Roofing

Johns-Manville—36 page, illustrated booklet on "Bonded Built-Up Roofs". Information on latest type of built-up roofing. Contains more than forty complete detailed specifications on this type of roof. A newly organized table of condensed specifications forms a quick and convenient method of securing data.

(7)—Power Unit

The Ready-Power Co.—4 page, illustrated bulletin No. 92. The new "Standard" Ready-Power industrial truck power plant announced in this publication is for 2 to 5 ton industrial trucks, with voltages of 36-40 or 60. Full technical specifications are given.

(8)—Fork Trucks

The Elwell-Parker Electric Co.—4 page, illustrated bulletin. Type "F-8" tiering fork trucks with a maximum fork height of 105 inches are shown in use in steel and metalworking plants. General specifications and structural details are given.

(9)—Pumps

Vickers, Inc.—6 page, 2 color bulletin 37-5. Graphic charts on pump performance curves, blueprints on 6 different types together with complete performance data on vane type rotary pumps in capacities of 18, 28 and 35 G.P.M.

(10)—Electro-Galvanizing

The Meaker Co.—32 page, 2 color, illustrated booklet. Meaker equipment and accessories for electro-galvanizing all types of materials are shown by photographs and blueprints and fully described. The Meaker process is covered fully.

(11)—Planking

American Cyanamid & Chemical Corp.—28 page, thumb-indexed catalog, A.I.A. File No. 10. Gypsteel Plank; precast slabs for floors, ceilings and roof decks; partition tile and plasters; plaster board and wall board are described and illustrated in industrial applications. Convenient indexing makes reference easy.

(12)—Dial Indicators

The L. S. Starrett Co.—Second Edition of 48 page catalog. A complete line of dial gages for the tool and machine industry is shown and described. Gages for all purposes, calibrated to suit requirements, together with a complete list of replacement parts are fully covered.

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HELPFUL LITERATURE

(13)—Truck Controller

The Yale & Towne Manufacturing Co.—6 page, three color folder P-359. An entirely new kind of cam-operated contactor controller called the Cam-O-Tactor, has just been announced, and is described in detail. Standard on all Yale electric trucks, this new unit makes and breaks contact without creating sticking or welding of surfaces due to arcing.

(14)—Needle Bearings

Norma-Hoffman Bearings Corp.—8 page, illustrated bulletin No. 962. Needle roller bearings and needle rollers are particularly applicable where minimum weight, low friction, and highly concentrated load capacity are requisites. Complete data as to sizes, dimensions, and load ratings of complete bearings are given.

(15)—Resistance Starter

Allen-Bradley Co.—4 page, loose-leaf filler bulletin No. 742. Describes application, features and operation of automatic compression resistance starter providing stopless, smooth acceleration for squirrel cage polyphase motors.

(16)—Plastics

Bakelite Corp.—16 page booklet. Relates history of modern plastics up to the present and points out the broad fields served by these synthetic materials. This booklet, the story of Bakelite plastics, is told in concise, entertaining style.

(17)—Stainless Steel

Rustless Iron & Steel Corp.—60 page, 2 color handbook. Describes all types of stainless steel for fabricators. Complete data on alloy content, general processing instructions and engineering data. General engineering information and tables are also included.

(18)—Ball Bearings

The Fafnir Bearing Co.—124 page, illustrated, wire bound and thumb-indexed catalog No. 35A. Complete data and specifications of ball bearings and heavy duty roller bearings are included in this book. Various types and sizes are described in detail and load ratings are included. Engineering data is included.

(19)—Forging Presses

The Ajax Manufacturing Co.—16 page, 2 color, illustrated bulletin No. 75. Solid frame forging presses in sizes from 500 tons to 2000 tons for accurate hot forging and precision hot and cold coining are described. Structural and design features are explained in detail.

(20)—Lathes

The R. K. LeBlond Machine Tool Co.—16 page, multi-color, illustrated bulletin No. 11-19-R.P. Rapid production lathes, divided into five classes, each fitted for jobs that require specially built equipment, are described in detail. 31 tool set-ups for increased production, and complete specification tables are given.

(21)—Grinding Wheels

Norton Co. — 6 page, illustrated folder No. 1223-2P. The system of marking and identifying Norton grinding wheels is explained in detail, in order that users may have full information on the full characteristics of any given wheel.

(22)—Pneumatic Tools

The Cleveland Pneumatic Tool Co.—8 page, 2 color bulletin No. 79. Pictures and describes light riveters, squeeze riveters, rotary air drills, rotary polishers and grinders, nut setter and screw driver, and sheet holders for airplane plants and hangers.

(23)—Instrument Measurement

General Electric Co.—32 page illustrated book GED-638. "When You Can Measure" is the title of this brochure describing in pictures and in words the story of how instruments are designed, constructed and tested by this company. A section of the book is devoted to a description of this company's standards of voltage, resistance, time and temperature.

(24)—Fence

Wickwire-Spencer Steel Co. — 44 page, illustrated, 2 color catalog No. F-120. Chain Link Fence is fully described and illustrated, and complete erection service, construction, specifications, etc., are given. Fence for all types of property protection are covered as well as fittings and structural details.

(25)—Bending Machines

Wallace Supplies Mfg. Co.—8 page, illustrated bulletin No. 29. Hydraulic, motor driven and hand operated bending machines, cutters, notchers, drill presses, cut-off saws and metal furniture are described. A new bending service for production or limited quantities is also announced.

(26)—A. C. Generators

Westinghouse Electric & Mfg. Co.—16 page, illustrated booklet No. B.2116. Installations of generators connected to many styles of diesel engines are pictured and the construction details of the electrical and mechanical parts are shown. Descriptive material covers the main features and advantages of these generators.

(27)—Hose & Couplings

Chicago Metal Hose Corp.—4 page, 2 color, illustrated folder on Avioflex hose and Avio-Tite detachable couplings. This multi-protected hose, used for oil connections on numerous machines is described in detail. Methods of installing the couplings is shown in sequence picture form. Cross sections show structural characteristics of both units.

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Have You Seen This HELPFUL LITERATURE?

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(1)—Flame Hardening

Air Reduction Sales Co.—24-page bulletin on the Airco process of flame hardening. Complete discussion of Oxyacetylene flame hardening is given with illustrations showing different ways in which flame hardening is accomplished. The listing of Airco-DB flame hardening apparatus completes the book.

(2)—Turning Tools

R and L Tools.—32 page, illustrated, pocket size booklet. This combination right and left hand tool, in addition to replacing an assortment of fourteen tools, is adjustable in ten seconds. Full information on prices, sizes and capacities of various sizes is included.

(3)—Shop Equipment

Atlas Press Co.—32 page illustrated general catalog No. 28. Gives complete information on lathes, drill presses, arbor presses, shapers and accessory equipment. Full specifications and prices are included. A new shaper with 7 inch stroke and a backgeared screw-cutting lathe with 6 inch swing are announced for the first time.

(4)—Insulation

Johns-Manville—48-page book entitled "Heat" telling the story of man's struggle to control the powerful force of heat. The book is divided into five chapters, the last two dwelling on modern materials available for conserving heat and uses of these materials.

(5)—Conduit

The American Brass Co.—12 page, 2 color, illustrated booklet No. E-12 (Fourth Edition). "Everdur" electrical conduit, available in two wall thicknesses, is described as being 100 per cent non-rusting, highly corrosion resistant, strong, durable and non-magnetic. Numerous fittings are also shown.

(6)—Drop Hammers

Erie Foundry Co.—24 page, multicolor bulletin No. 325. Steam drop hammers rated in size from 400 to 50,000 pounds are shown and covered in detailed specifications. Numerous construction, cross-sectional and shop pictures show how these hammers are built and used.

(7)—Hand Shears

Bremil Mfg. Co.—4 page folder. Compound leverage, all-alloy, portable hand shears available in 2 sizes, are described. Removable blades are of shear blade alloy steel. Special blades for cutting stainless steel are available.

(8)—Speed Reducers

W. A. Jones Foundry & Machine Co.—132-page, spiral bound catalog No. 70. General catalog on Herringbone speed reducers illustrating many types, includes horsepower ratings and permissible overhung loads, dimensions and weights, and assembly diagrams. Gives information on speed increasers.

(9)—Welding

Metal & Thermit Corp.—12-page illustrated bulletin No. 20 on the welding of high-pressure, high-temperature piping. Discusses selection of pipe materials and welding electrodes, weld design, welding procedure, preheating, stress relieving, testing of welds, and the qualification of welding process and welding operators.

(10)—Monel Metal

The International Nickel Co., Inc.—8 page, illustrated bulletin. Monel gaskets, pump parts and valve trim are shown in numerous industrial applications. A list of distributors of Monel and other INCO products throughout the country is given.

(11)—Hoists and Gates

S. Morgan Smith Co.—36-page, 3 color bulletin No. 137. Discusses several styles of hoists, in each case a reproduction of a blueprint and a picture of the hoist is shown. A general description and actual use of gates in controlling water are described, using many photographs.

(12)—Porcelain Enamel

The American Rolling Mill Co.—4-page, 4 color bulletin "Six Little Words." Discusses and lists the advantages of using porcelain enamel on ARMCO ingot iron signs. Several photos showing signs using porcelain enamel on ARMCO ingot iron are included.

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(13)—Furnace Design

M. H. Detrick Co.—68-page, many colored, spiral bound catalog. Describes Detrick refractory walls and arches as applied to a wide variety of furnace designs. Complete dimensional and construction details are given on arches, walls and doors. Many types of furnaces are thoroughly described using Detrick insulated walls and arches, supplemented with illustrations and cross-sectional views. Several before-and-after pictures, as well as charts, are shown. The book ends with a problem and solution.

(14)—Fans

Kisco Co., Inc.—4-page, 2 color bulletin No. DF-438 on Kisco "Deflecto" air recirculators. Describes many uses and advantages of air-conditioning and illustrates several models of Deflecto fans, including the Kisco Cool-Circle-Ator Table.

(15)—Stainless Steels

United States Steel Corp.——64-page, 2 color, illustrated booklet "The Fabrication of USS Stainless Steels, Part I." Describes in detail the welding, riveting and soldering techniques applicable to all various grades of USS Stainless Steels.

(16)—Drilling and Tapping Machines

Edlund Machinery Co., Inc.—8-page, illustrated bulletin No. 105. Describes and pictures No. 1B drilling and tapping machines. Specifications, motor data and table of speeds obtainable are given.

(17)—Spray Painting

Binks Manufacturing Co.—90 page, loose-leaf catalog No. 73. Complete information and specification data on spray painting and finishing equipment is given in detail. Complete units and parts are shown.

(18)—Valves

Crane Co.—8 page, illustrated bulletin. Called "The Inside Story of Crane Plug Disc, Globe and Angle Valves", this bulletin shows cross-sectional pictures of valves and discusses the various designs. Numerous pictures of laboratory tests are shown.

(19)—Marking Paint Stick

Helmer-Staley, Inc.—6 page folder PL-100. "Paintcil" is solidified paint in stick form, for marking on hard surfaces either hot or cold. Its uses and advantages are shown and described in detail.

(20)—Conveyors

Logan Co., Inc.—38-page, 2 color, wire bound catalog No. 22. This catalog on conveyors for the steel mill is profusely illustrated with pictures showing typical applications. Reproduction of blueprints is shown with each type of conveyor.

(21)—Tester

The Alpha-Lux Co., Inc.—4-page, illustrated pamphlet on "Speedy" moisture tester. Describes instrument for testing moisture content of sands, clays and other materials used in iron, steel and malleable foundries.

(22)—Clinchor

The Tomkins-Johnson Co.—2 page, illustrated bulletin No. C-2. Describes completely the operations of the Clinchor method of setting nuts. Pictures and specifications are given of this fully automatic machine which is controlled by a single foot pedal.

(23)—Industrial Ovens

J. O. Ross Engineering Corp.—The designing of industrial ovens, involving three principal problems, oven construction, method of heating, and material handling, is discussed completely in the 16-page illustrated bulletin No. 123.

(24)—Turret Lathe

The Bullard Co.—22 page, spiral bound, booklet VT-15-24. Vertical turret lathes in sizes from 24 inch to 64 inch, spiral drive type are discussed and pictured in detail. Full specification tables and close-up pictures of the units on different types of work complete the book.

(25)—Presses

Niagara Machine & Tool Works—40 page, illustrated bulletin No. 58-G shows Niagara inclinable open back power presses, for a wide range of die operations, including cutting, drawing, forming, bending, etc.

(26)—Metal Balers

Logemann Brothers Co.—4 page bulletin No. 190 on triple-compression, hydraulic metal balers. Pictures and describes two types of balers, giving details of operations in each case. Illustrations of two extreme examples of hydraulically-compressed scrap are shown.

(27)—Materials Handling Equipment

Truscon Steel Co., Pressed Steel Div.—16-page, 2 color booklet on Truscon Materials Handling Equipment. Describes and illustrates many types of steel boxes and skid platforms, showing close-up views in many cases. Tables for both boxes and platforms are given.

(28)—Bearings

Boston Gear Works, Inc.—16-page, 3 color booklet on oilite oil-cushion precision bronze bearings, a Chrysler product. Complete specifications are given on the plain cylindrical type, flange type, and thrust type. Practical data and characteristics complete the booklet.

(29)—Conveyor Idlers

The C. O. Bartlett & Snow Co.—24 page, illustrated bulletin No. 80. Shows by means of photographs and drawings, the various types of belt conveyor idlers available. Full specification tables and a page on pressure lubrication fittings are provided.

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(1)—Annealing Furnace

Lee Wilson Engineering Co.—6-page, 3 color folder on a cylindrical annealing furnace for wire or strip. Charts are given showing efficiency of temperature control and a cut-away sectional illustration gives a comprehensive view of engineering design and construction of special features of the furnace.

(2)—Lifting Magnets

Dings Magnetic Separator Co.—20-page, 3 color catalog No. 22. Describes method for metal handling by use of high intensity lifting magnets. Gives operating data, construction and design, and photographs of many examples of uses of magnets. Information is also given on different types of magnetic separators.

(3)—Header Attachment

B-W Mfg. Co.—How to get important savings in cold header operation is discussed in the booklet on B-W Wire Drawing Attachment for Cold Headers. This attachment converts rods into wire, taking less than 60 seconds to restock it.

(4)—Wagon Crane

The Browning Crane & Shovel Co.—4 page, 2 color bulletin No. 338-1. The Browning mobile wagon unit is available with diesel, gasoline or oil power, with solid or pneumatic tires. A shovel, crane, drag line, back hoe combination with one man operation and a single power unit.

(5)—Fire Extinguisher

Walter Kidde & Co., Inc.—12-page, 2 color booklet on LUX fire extinguisher system. Describes and illustrates how carbon dioxide extinguishers when properly installed lessen the chance of fire invasion and eliminate damage caused by other method. These systems can be operated either manually or automatically. Many pictures show various installations of this system.

(6)—Stainless Steel Tubing

Standard Tube Co.—6-page, 2 color folder on STANCO stainless steel tubing. A brief discussion is given on each of three types of tubing—seamless, welded and butted. An illustration accompanies each discussion. Specific uses for each type are listed.

(7)—Polishing and Buffing Machines

Hammond Machinery Builders, Inc.—8-page, 2 color booklet on Type J automatic polishing and buffing machines. Booklet includes pictures of several different types of machines, a list of users, specification tables and lists products finished on these machines.

(8)—Rectifiers

Westinghouse Electric & Mfg. Co.—12-page, 2 color, illustrated pamphlet B-2113 discusses various characteristics of Rectox Rectifiers, gives list of applications and points out advantages.

(9)—Conveyors

Standard Conveyor Co.—48-page, 2 color, spiral bound catalog No. 2. Describes and illustrates various applications of conveyors in steel mills, foundries and machine shops. Detailed drawings and specifications of latest bearings designed for these industries are given.

(10)—Speed Nut System

Tinnerman Stove & Range Co.—4-page, 2 color booklet on "Speed Nut System." This booklet is designed to bring out the outstanding merits of the speed nut system of assembly showing, by use of illustrations, how to adapt speed nuts for different uses.

(11)—Welding

The Lincoln Electric Co.—36-page, 2 color booklet on "How to Change Over to Welded Design for Profits." Many pictures showing the comparison in price between cast and welded design are given, each carrying a brief discussion. Photographs and testimonials of executives and engineers are included. The book is completed with illustrations showing how to change over to welded design.

(12)—Hack Saw Blades

Henry Disston & Sons, Inc.—4-page, loose-leaf bulletin on hack saw blades. Discusses their selection and care giving recommendations on both machine and hand blades. Diagrams are given illustrating the recommendations.

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(13)—Metal Stamping

Precision Metal Workers—4-page, illustrated booklet on metal stamping. Complete operations—stamping, forming and assembling are described. Pictures of various jobs done in this plant are shown.

(14)—Cut-Off Machine

The Tabor Manufacturing Co.—8 page, illustrated bulletin No. 376. "Tabor-Brasive" cut-off machine is designed for, and in use by, foundries, refractories and manufacturers or users of tough metals and alloys, plastics, stone, glass, etc. Available in several types, complete information on each is given.

(15)—Scrap Metal Presses

Logemann Brothers Co.—4-page booklet on Logemann Triple-Compression Scrap-Metal Presses. Several pictures show construction detail. A discussion on the operation and on individual parts of the press is given.

(16)—Welding

Ingersoll Steel & Disc Div.—20-page, 2 color manual on the welding and fabricating procedures for IngAclad stainless clad steel. A complete discussion is given supplemented by many illustrations showing applications.

(17)—Coke Ovens

Wilputte Coke Oven Corp.—36-page, 2 color book on coke ovens. Describes the oven and its development by the use of many drawings and pictures. Heat distribution calculations and tables are given.

(18)—Wall and Arch Construction

Geo. P. Reintjes Co.—16-page, 2 color bulletin No. 301. Describes and discusses wall and arch construction giving cross-sectional views, and standard details. Illustrations are given showing typical installations.

(19)—Lubricants

Fiske Brothers Refining Co. — 16 page, illustrated folder. "Lubriplate" is the name by which this specially developed lubricant for all types of bearings and contacting surfaces, is known. It is said to be long lasting, and corrosion resistant, and maintains its lubricating qualities under extreme conditions.

(20)—Rolling Mill Pyrometer

Bacharach Industrial Instrument Co. —12 page, illustrated bulletin No. 268. The "Velarmeter" was developed specifically for rolling mill service. Its functions are for indicating, recording and signaling. Scales, charts and complete information are provided.

(21)—Instrument Boards

Foxboro Co.—22-page, 2 color bulletin No. 223 describing standard practice in control board design. Gives brief discussion of design and materials supplemented by specific information on standard sizes of panel boards available in different materials. Illustrations show typical layouts for instrument boards.

(22)—Everdur Metal

The American Brass Co.—15-page bulletin No. E-4 (Sixth Edition). Discusses welding properties and methods of procedure in welding Everdur Metal up to and including 3/16-inch thickness and metal over 3/16-inch thickness. A complete table suggests procedures for welding Everdur.

(23)—Throttling Controller

C. J. Tagliabue Mfg. Co.—4-page, illustrated bulletin No. 1173 on CELECTRAY throttling controller for electric furnaces. Gives complete description of controller showing inside and outside views. Specifications for single point and two-point indicating controllers are included.

(24)—Arc Welder

General Electric Co.—4-page, illustrated bulletin GEA-2776 on G-E Gasoline-Engine-Driven Arc Welder with Ford V-8 Engine, Type WD-32BY. Describes three major essentials for welding profits; self-excitation, duplex control and self-stabilization.

(25)—Carbon Tool Steels

Midvale Co.—16-page, 2 color booklet on Midvale carbon tool steels. A general discussion is given as well as directions for working, forging, annealing and hardening carbon tool steels. It includes tables on tempering grades and a table for converting inches to decimal parts of a foot.

(26)—Motor Starters

The Electric Controller & Mfg. Co.—4-page, illustrated bulletin No. 1045 with price sheet on motor starters for reduced voltage starting of squirrel cage motors. This bulletin gives standard and optional features and includes tables and outline dimensions in inches and weights.

(27)—Forging Presses

The Ajax Mfg. Co.—16-page, 2 color bulletin No. 75 on AJAX solid frame forging presses. Contains many illustrations of various types of forging presses with a brief discussion on each. Presses are built in six sizes in capacities from 500 to 2000 tons.

(28)—Alloys

Wilcox-Rich Div.—4-page, illustrated booklet entitled "Hard Facts" No. 4. Gives many items on Wilcox-Rich alloys including a discussion on properties of XALOY. A description and illustrated comparison showing the range of hardness and corrosion resistance provided by these alloys is given.

(29)—Rivets

The H. A. Wilson Co.—4-page, 3 color booklet giving general descriptive data on composite silver rivets. Important features are listed and drawings are pictured supplemented by a table giving complete explanation of drawings.

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(1)—Stainless Steel

Allegheny Steel Co.—16-page booklet entitled "As the World Sees Allegheny Metal." This booklet is profusely illustrated showing the uses of stainless steel in food preparation, building construction, hospitals and clinics, homes, chemical processing, and industry in general.

(2)—Materials Handling Equip.

Lewis-Shepard Co.—4-page circular No. 323. Purpose of circular is to show ways of introducing safety in indoor transportation by the use of materials handling equipment. Illustrations are given showing the use of brakes on trucks. Also pictures the handling of storage batteries, carboys, drum drains and barrels.

(3)—Pipe Pickling Machines

The Alliance Machine Co.—4-page, illustrated bulletin No. 36. This bulletin gives a general description of the pipe pickling machine, which may be furnished with either a ratcheting or non-ratcheting type of lifting beam. A typical installation drawing is also included.

(4)—Electrical Outlets

Bull Dog Electric Products Co.—12-page, 2 color booklet on how to mobilize lighting and power outlets in industrial plants for Trol-E-Duck. An illustrated plant tour showing applications of this flexible wiring system is given. Cross sectional views are also included.

(5)—Electrode

Page Steel & Wire Div.—12-page, 2 color booklet on Page Hi-Tensile G, a new electrode for flat and positioned fillet and general flat welding, which can be used with either motor generator or transformer type machines. Specifications are given.

(6)—Forgings

Drop Forging Association—8-page, illustrated monthly publication for April. Contains many items on the uniformity and efficiency of forgings in well-known manufacturing plants. Includes editorial on how machinability of forgings aids in maintaining production time schedules.

(7)—Crank Pin Grinder

Landis Tool Co.—12-page, 2 color, catalog No. N-38. Discusses and illustrates the Landis 16" Type D hydraulic crank pin grinder giving sizes, general advantages and operation of the machine. Details of design and a specification table are included.

(8)—Hardening

Ajax Electric Co., Inc.—2-color reprint on high speed steel hardening in the Ajax-Hultgren salt bath furnace. Battery of these furnaces is illustrated. A list of advantages is also included.

(9)—Spray Cleaner

Homestead Valve Mfg. Co.—6-page, 2 color, pocket-size folder entitled "Steam Clean with Hypressure JENNY." Describes and illustrates many uses of this steam vapor spray cleaner.

(10)—Pipe Working Machy.

Cox & Sons Co.—32-page, 2 color general catalog on pipe cutting and threading machinery. Each type of machine is described and illustrated. Specifications are given. Includes information on scrap bundling machine.

(11)—Furnace

The Gas Machinery Co.—10-page, loose-leaf catalog on car type furnace with seal and syphon vents for annealing, heat-treating, malleabilizing and stress relieving. Drawings and full-page illustrations are given.

(12)—Engines

Worthington Pump & Machinery Corp.—36-page, 2 color bulletin No. S-500-B13. Illustrates various installations of diesel and gas engines in fields where power is an essential factor, thus showing their wide range of sizes and services.

(13)—Hydraulic Units

Hannifin Mfg. Co.—28-page 2- color bulletin No. 42. Describes and illustrates both portable and stationary types of hydraulic riveting, punching and pressing equipment. Specifications are given in each case.

(14)—Suspended Magnets

Stearns Magnetic Mfg. Co.—4-page bulletin No. 25 on high duty safety suspended magnets. Folder describes and illustrates three types of suspended magnets—circular, rectangular and hand.

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(15)—V-Belts

The Manhattan Rubber Mfg. Div.—4-page, 3 color bulletin No. 6868. Details of functions and construction of the V-belt are described. Photographs of installations, list prices and a V-belt comparison table are included.

(16)—Controllers

The Electric Controller & Mfg. Co.—8-page, illustrated bulletin No. 960-A on EC&M Type V dinkey controllers designed specifically for crane service. Data on ratings and weights outline dimensions and typical crane cage layouts are given.

(17)—Oil Well Chain

Chain Belt Co.—36-page, 4 color bulletin No. 305, made up in data book form on REX oil well chain. Describes, pictures and lists strengths of chains. Includes specification tables and a discussion on the care of drilling chains.

(18)—Hydraulic Lift Truck

Lyon Iron Works—4-page, illustrated bulletin No. 111. Describes Lyon hydraulic pallet lift truck. Specifications are given and a suggested design for a two-faced pallet to be used with this lift truck is included.

(19)—Portable Electric Tools

Independent Pneumatic Tool Co.—52-page, 2 color catalog No. 35. General catalog on electrical tools including drills, hammers, saws, screw drivers, grinders, polishers, sanders and heat guns. Each tool is pictured and a table, showing characteristics of each, is given.

(20)—Refractory

Quigley Co., Inc.—4-page bulletin No. 327-A on "Insulag," a refractory lagging for temperatures up to 2200 degrees Fahr. The properties of "Insulag" are discussed and a table on "Insulag" vs. fire brick is given.

(21)—Tempering

Leeds & Northrup Co.—36-page catalog describing many varieties of work now being tempered, annealed or normalized in Homo furnaces. Reproductions of actual chart records and many photographs showing different types of installations are given.

(22)—Elevator Rope

Broderick & Bascom Rope Co.—36-page, illustrated, elevator rope catalog. Gives details of rope construction and definite recommendations as to ropes best suited for different types of elevators. An article on factors affecting the service of elevator rope is included.

(23)—Refractory

The Ironton Fire Brick Co.—4-page, 2 color folder on "Ironton Nojoint" plastic refractory. Gives instructions on the application of this refractory. Illustrations show uses of "Ironton Nojoint." Other products manufactured by this company are listed.

(24)—Mult-Au-Matic

The Bullard Co.—12-page 2 color booklet on Type J Mult-Au-Matic, a machine designed for the field of small high-speed work. Both a general and a detailed description of this machine are given as well as pictures and machine specifications.

(25)—Valves

Crane Co.—36-page, 2 color booklet "The Valve World" for May-June. Booklet contains illustrated articles on valves, fittings and fabricated piping. A spread is devoted to pictures showing typical Crane piping installations.

(26)—Marking Paint Stick

Markal Co.—6-page, 2 color folder on Markel paint stick. Illustrates and discusses many uses of paint stick for marking on either hot or cold surfaces. Available in six colors. Gives names of many users of Markal.

(27)—Metal Cutting Machines

DeWalt Products Co., Inc.—6-page, 2 color catalog on metal cutting machines. Pictures and discusses cutting ferrous and nonferrous metals with saw blades, cutting dry and wet with abrasive wheels, and cutters for special applications. Lists users of DeWalt metal cutting machines.

(28)—Belting and Lubrication

E. F. Houghton & Co.—36-page, 3 color book entitled "Research Illustrated" Vol. 3 No. 1, Articles on belting and lubrication are presented in non-technical language, each article being illustrated. Publication includes a department on questions and answers.

(29)—Foundry Equipment

Whiting Corp.—56-page, 3 color book No. 226. Book discusses and pictures methods of melting metal for castings by means of the cupola, rotary furnace, cradle furnace, air furnace, side-blow converter and duplexing equipment. Includes a table on comparative value of fuels.

(30)—Heat Treated Alloy Steels

Joseph T. Ryerson & Son. Inc.—4-page, 2 color folder giving description and data on the high physical properties of Rycrom and Nikron "M", two heat treated alloy steels used for a variety of heavy duty applications.

(31)—Foundry Equipment

The Jeffrey Manufacturing Co.—50-page, illustrated catalog No. 690. Illustrates and describes complete line of conveying, handling and conditioning equipment for the foundry. Shop pictures and complete specifications accompany the descriptions.

(32)—Magnetic Separation

Dings Magnetic Separator Co.—25-page, illustrated catalog No. 770. Super high intensity magnetic separators known as the Induced Roll machine and the Cross Belt type separator for separation of weakly magnetic materials are described. Complete specifications are given. A table of relative magnetic attractive force of various minerals is included.

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(1)—Stainless Steel

United States Steel Corp.—16-page, illustrated booklet "USS Stainless and Heat Resisting Steels for the Process Industries". A full list of USS chromium and chromium-nickel stainless steels is given and described in detail. Charts and discussion present information on composition and properties and application of the alloy. A complete list of chemicals and acids and USS stainless steel's resistance to them is shown.

(2)—Liquitol

The Alpha-Lux Co., Inc.—4-page bulletin AL-22. Properties and uses of Liquitol in securing sound iron and steel castings and ingots are described. Various grades of Liquitol and instructions for its use for various types of metal are explained.

(3)—Relief Valves

Vickers, Inc.—4-page, 2 color bulletin No. 37-3. Balanced piston-type relief valves for oil of the hydrocone type for pipe sizes from ½ to 2 inches are described and blueprints of their construction are shown. Application data is given.

(4)—Alloy Steels

Bliss & Laughlin, Inc.—4-page, 3 color illustrated bulletin. General discussion of alloy steels for use in most industrial applications. Machine rating and turning speed of 37 types of alloys are given.

(5)—Salt Tablets

Morton Salt Co.—4-page bulletin. Describes benefits of making salt tablets available to workmen. Salt tablets improve efficiency and reduce summer hazards due to heat. A convenient dispenser is described.

(6)—High Speed Clutch

Federal Press Co.—4-page, illustrated bulletin. Complete information on the new Federal multi-pin, heavy duty, high speed clutch which may be installed on any Federal high speed press. Claims of economy of maintenance, reduction of down time and increased production are made. A table of detailed specifications of flywheel type presses is also given.

(7)—Pyrometers

Foxboro Co.—8-page, illustrated bulletin No. 193-3. Indicating pyrometers of the mono-pivet type, importable and instrument panel types are described. Standard scales in a wide range of types are shown. The principle of the mono-pivet movement is shown in detail. Numerous uses and applications are given.

(8)—Wrought Iron Pipe

A. M. Byers Co.—40-page illustrated booklet. Describes method of manufacture and advantages of using wrought iron under various industrial conditions. One section of the book is devoted to means of reducing effects of corrosion.

(9)—Ledloy

Inland Steel Co.—4-page, illustrated bulletin No. 50. Announcement of Inland Ledloy, a new lead-bearing open hearth free cutting steel. Steps in development, physical properties and a table of machinability are given. Claims for this alloy are increased tool life, grain refinement, broad adaptability and unchanged heat treating and welding characteristics.

(10)—Gear Units

Farrel-Birmingham Co., Inc.—80-page, illustrated catalog No. 438. Herringbone gears in speed reducing and speed increasing units and related products are described. Tables of horsepower ratings, service factors, overhung load capacities, dimensions and weights are included.

(11)—Unit Load System

Acme Steel Co.—22-page, illustrated bulletin No. 1017. The Acme unit load for bracing carload freight uniform and mixed loadings is described in detail. Freight car, flat car and gondola car methods of loading are described. Unit load equipment, bands, seals and stays are shown.

(12)—Metal-Cutting Machine

DeWalt Products Corp.—Bulletin on type GE metal cutter. Information on capacities and types of work is given. Complete specifications are provided on machines for cutting different types of materials.

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(13)—Stainless Steel

Republic Steel Corp.—24-page bulletin No. 144, second edition. Enduro, 18-8 types of stainless steel are described in detail, and analysis, physical properties, fabrication and characteristics are given. Complete tables show properties and principal uses of each type. A laboratory corrosion data chart is also included.

(14)—Lubrication

Shell Petroleum Corp.—48-page, 4 color, illustrated booklet on "Diesel Engines and Their Lubrication". This is one of an educational series of booklets on lubrication for executives, engineers, salesmen and students. Provides graphic descriptions of diesel power and its uses. A full discussion of diesel engine lubrication is given.

(15)—Metal Shapes

Dahlstrom Metallic Door Co.—167-page, illustrated catalog. Describes and illustrates with actual size section drawings the innumerable shapes produced by this company from practically all commonly used metal. Simplified indexing and classification sectionalizing make this book easy to use.

(16)—Pumps

Aurora Pump Co.—4-page illustrated bulletin No. 11. Apco master turbine-type pump for small capacities and high heads are described in detail. Construction specifications and a complete list of features accompanies the description.

(17)—Motor Starter

Allen-Bradley Co.—Loose-leaf bulletin 746. Describes application, standard features and operation of automatic transformer type starter for polyphase squirrel-cage motors. Price sheet to accompany this bulletin is available.

(18)—Plumbing

Crane Co.—32-page booklet AD-1231. Installation and unit photographs show plumbing and heating equipment in industrial buildings. Included are such subjects as proper sanitation in industry, dangers of back siphonage, lavatories, faucets and fixtures for wash sinks, showers, drinking fountains, etc. Industrial hospital equipment is also covered.

(19)—Fans and Ventilators

Propellair, Inc.—52-page book. Fans of the propeller type are described and illustrated in numerous industrial applications. Engineering data for determining requirements for ventilation and exhaust purposes is given. A chart for figuring duct resistance is included.

(20)—Screw Drivers

Stanley Electric Tool Div., The Stanley Works—8-page, illustrated bulletin No. S-67. Applications and specifications of Stanley electric screw drivers together with complete price list and description of screw driver bits and socket wrenches are given. Numerous sizes of tools are available.

(21)—Disinfectant

Huntington Laboratories, Inc.—4-page, 2 color bulletin. Loss of productive time, compensation losses and spread of infection are eliminated with Derma-San it is claimed. Can be used in cutting oils or added to water for cleaning woodwork, etc.

(22)—Bench Rivitor

The Tomkins-Johnson Co.—4-page bulletin BR-1. The bench Rivitor with controlled setting action is capable of 215 strokes a minute using solid rivets. Characteristics and operation of the machine are given in detail and a complete list of specifications is included.

(23)—Stainless Steel

The American Rolling Mill Co.—16-page booklet "Selling Points". This booklet illustrates and describes ARMCO stainless steel, its chemical and physical properties and advantages in domestic and industrial uses.

(24)—Mult-Au-Matic

The Bullard Co.—12-page bulletin J-11. Type J-11 Mult-Au-Matic machine is completely described and specifications are given. Four types of heads are illustrated and a table of feeds and strokes of tool heads is shown.

(25)—Automatic Strainer

H. A. Brassert & Co.—4-page, 2 color, illustrated bulletin. The self-cleaning Brassert automatic strainer continuously and automatically removes suspended solids from liquids. Construction details, operation and advantages are given. Tables of water capacity and dimensions complete the bulletin.

(26)—Ampco Metal

Ampco Metal, Inc.—Engineering data sheet No. 53. Physical properties, metallurgical aspects and service records of Ampcoloy 44 are given in detail. This metal has recently been developed for butt and flash welding applications.

(27)—Recorders

Baldwin-Southwark Corp.—16-page illustrated bulletin No. 140. Describes complete line of stress-strain recorders and extensometers, applicable to practically all existing testing machines. A variety of typical curves and a discussion of the application and uses of these recorders are given.

(28)—Impulse Turbines

S. Morgan Smith Co.—32-page, 2 color bulletin No. 138. Impulse turbines for use under all conditions are described. Typical curves and installation photographs together with blueprints of typical arrangements and tables for determining requirements are included.

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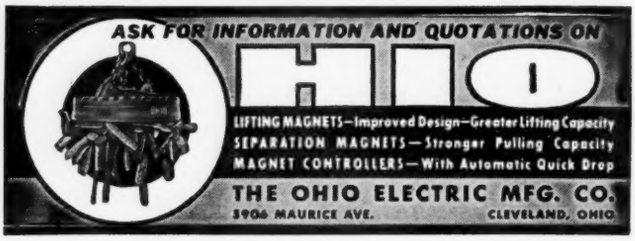
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PROCUREMENT DIVISION, Public Buildings Branch, Washington, D. C., June 4, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 6, 1938, for construction of the U. S. P. O. at Traverse City, Mich. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $10 per set, which will not be returned. Checks offered as payment for drawings must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them availlable for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

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◆ ◆ ADVERTISING INDEX ◆ ◆

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Page

A

Acme Galvanizing, Inc. —
Acme Steel Co. —
Acme Steel & Malleable Iron Works —
Adelphia Hotel —
Aetna-Standard Engineering Co. —
Air Reduction Sales Co. —
Alan Wood Steel Co. —
Aldrich Pump Co. —
Allen-Bradley Co. —
Allis-Chalmers Mfg. Co. —
Alox Corporation —
Alpha-Lux Co., Inc., The —
American Brass Co., The —
American Bridge Co. —
American Chemical Paint Co. —
American Engineering Co. 61
American Gas Association —
American Gas Furnace Co. —
American Hammered Piston Ring Division of Koppers Co. —
American Hot Dip Galvanizers' Association —
American Manganese Steel Div. of The American Brake Shoe & Foundry Co. —
American Monorail Co. —
American Murex Corp. —
American Pulverizer Co. —
American Rolling Mill Co. —
American Shear Knife Co. —
American Steel & Wire Co. 46, 47
American Tinning & Galvanizing Co. —
Amsler-Morton Co. —
Anaconda Wire & Cable Co. —
Angle Steel Stool Co. —
Apollo Steel Co. —
Appalachian Coals, Inc. —
Armstrong Cork Products Co. —
Atlantic Stamping Co. —
Atlas Car & Mfg. Co. 75
Atlas Drop Forge Co. 85
Automatic Transportation Co. —

B

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Bank of New York & Trust Co. —
Bantam Bearing Corp. —
Barnes, Wallace, Co., The, Division of Associated Spring Corporation —
Bartlett Hayward Division of Koppers Co. —
Bay City Forge Co. —
Bellevue-Stratford Hotel —
Belmont Iron Works 86
Benjamin Franklin Hotel —
Berger Manufacturing Div., Republic Steel Corp. —
Bethlehem Steel Co. 3
Birdsboro Steel Foundry & Machine Co. —
Bissett Steel Co., The 77
Blaw-Knox Co. 60
Blaw-Knox Division, Blaw-Knox Co. 60
Blaw-Knox Sprinkler Div., Blaw-Knox Co. —
Bliss & Laughlin, Inc. —
Boston Tow Boat Co. —
Brassert, H. A., & Co. 85
Bridgeport Brass Co. —
Brooke, E. & G., Iron Co. 86
Brookmire Corporation —
Brosius, Edgar E., Inc. —
Brown & Sharpe Mfg. Co. —
Brown Instrument Co., The —
Buffalo Forge Co —

Page

Buffalo Galvanizing & Tinning Works, Inc. —
Bullard Co. —
Buromin Co., The —

C

Cadman, A. W., Mfg. Co. —
Cambridge Wire Cloth Co. —
Campbell Transportation Co. 78
Carborundum Co., The 26
Carnegie-Illinois Steel Corp. 46, 47
Carpenter Steel Co., The —
Carter Hotel 83
Cattie, Joseph P., & Bros., Inc. —
Chain Belt Co. —
Chain Products Co. —
Chambersburg Engineering Co. —
Chicago Flexible Shaft Co. 85
Chicago Perforating Co. 85
Chicago Rawhide Mfg. Co. —
Cincinnati Grinders, Inc. —
Cincinnati Milling Machine Co. —
Cincinnati Shaper Co. —
Clark Controller Co. —
Cleveland Cap Screw Co. —
Cleveland-Cliffs Iron Co. —
Cleveland Crane & Engineering Co. Inside Front Cover
Cleveland Hotel —
Cleveland Tramrail Division, Cleveland Crane & Engineering Co. —
Cleveland Twist Drill Co. —
Climax Molybdenum Co. —
Cold Metal Process Co., The —
Colonial Steel Co. —
Columbia Steel Co. 46, 47
Columbian Steel Tank Co. —
Columbus Die, Tool & Machine Co. 85
Continental Machine Specialties, Inc. —
Continental Roll & Steel Foundry Co. —
Cooper-Bessemer Corp. —
Cowles Tool Co. —
Cramp Brass & Iron Foundries Co. —
Crane Co. —
Criswell, James, Co. —
Crocker-Wheeler Electric Mfg. Co. —
Crosby Co., The 86
Cullen-Friestedt Co. —
Curtis Pneumatic Machinery Corp. —
Cyclone Fence Co. —

D

Damascus Steel Casting Co. —
Darwin & Milner, Inc. 86
Detroit Leland Hotel —
Diamond Expansion Bolt Co., Inc. —
Dings Magnetic Separator Co. —
Dravo Corp. Machinery Division —
Driver-Harris Co. —
Drop Forging Association —

E

Eastern Gas & Fuel Associates —
Edison, Thomas A., Inc. —
Electric Controller & Mfg. Co. —
Electric Furnace Co., The —
Electric Storage Battery Co. 41
Electrochemical Process Division of Blaw-Knox Co. —
Electro Metallurgical Co. —
Elwell-Parker Electric Co. —
Emerman, Louis E., & Co. —
Engineering & Construction Division of Koppers Co. —
Enterprise Galvanizing Co. —
Erdle Perforating Co. —
Erie Bolt & Nut Co. —
Erie Foundry Co. —
Eureka Fire Brick Works —
Excelsior Tool & Machine Co. —

F

Fafnir Bearing Co. —

Page

Fairbanks, Morse & Co. —
Fanner Mfg. Co., Inc. —
Farrell Birmingham Co., Inc. —
Farval Corp., The Inside Back Cover
Ferracute Machine Co. —
Finn, John, Metal Works —
Firth-Sterling Steel Co. —
Flinn & Dreffein Co. 85, Back Cover
Foote Bros. Gear & Machine Corp. —
Ford Motor Co. —
Foster, L. B., Inc. 87
Foxboro Co., The 90

G

Gas & Coke Division of Koppers Co. —
General Electric Co. —
General Electric Vapor Lamp Co. —
Gibson Hotel —
Globe Steel Tubes Co. —
Goodrich, B. F., Co. 8
Gordon Lubricator Division, Blaw-Knox Co. —
Grammes, L. F., & Sons, Inc. —
Granite City Steel Co. —
Grant Gear Works —
Gray Chemical Co. —
Great Lakes Steel Corp. —
Gregory, Thomas, Galvanizing Works —
Gulf Oil Corporation —
Gulf Refining Co. —

H

Hagan Corporation —
Hagan, George J., Co. —
Halliden Machine Co., The Back Cover
Hanlon-Gregory Galvanizing Co. —
Hanna Furnace Corp. 76
Hannifin Mfg. Co. —
Harnischfeger Corp. 85
Harrington & Kin Perforating Co., The 85
Harter Corp. —
Heald Machine Co., The —
Helmer-Staley, Inc. —
Heppenstall Co. —
Hevi-Duty Electric Co. —
Hindley Mfg. Co. —
Hinman, D. A., & Co. —
Hodell Chain Co., The —
Holcroft & Co. 85
Holden, A. F., Co. —
Horsburgh & Scott Co. —
Hubbard, M. D., Spring Co. —
Hunt, C. H. —
Huther Bros. Saw & Mfg. Co. —
Hyatt Bearings Division, General Motors Corporation —
Hyde Park Foundry & Machine Co. —

I

Independent Galvanizing Co. —
Industrial Brownhoist Corp. —
Ingersoll-Rand Co. —
Ingersoll Steel & Disc Division, Borg-Warner Corp. —
Inland Steel Co. 12
International Derrick & Equipment Co. —
International Nickel Co., Inc. —
Irwin, H. G. Lumber Co. —

J

Jackson Iron & Steel Co., The —
James, D. O., Mfg. Co. —
Jamestown Malleable Iron Corp. —
Jessop, Wm., & Sons, Inc. —
Johns-Manville Corp. —
Jones & Laughlin Steel Corp. —
Joslyn Co. of California —
Joslyn Mfg. & Supply Co. —

K

Kardong Brothers, Inc. —
Keagler Brick Co., The —
Kemp, C. M., Mfg. Co. —

◆ ◆ ADVERTISING INDEX ◆ ◆

Where-to-Buy Products Index carried in first issue of month.

	Page
Kidd Drawn Steel Co.	—
King Fifth Wheel Co.	—
Koppers Company	—
Koppers Coal Co., The	—
Koppers-Rheclaveur Co.	—
Koven, L. O., & Brother, Inc.	—
Kron Co., The	—
L	
Laclede Steel Co.	—
Lake City Malleable Co.	—
Landis Machine Co., Inc.	—
Landis Tool Co.	—
Latrobe Electric Steel Co.	86
Leeds & Northrup Co.	—
Lehigh Structural Steel Co.	—
Leschen, A., & Sons Rope Co.	—
Levinson Steel Co., The	—
Lewis Foundry & Machine Co.	—
Lewistown Foundry & Machine Co.	—
Lincoln Electric Co.	—
Linde Air Products Co., The	—
Logemann Bros. Co.	—
Mc	
McKay Co., The	—
McKay Machine Co.	Back Cover
M	
Mackintosh-Hemphill Co.	—
Manville, E. J., Machine Co.	—
Marr-Galbreath Machine Co.	87
Maryland Drydock Company, The	—
Maurath, Inc.	—
Medart Co., The	—
Mechanite Metal Corp.	—
Mesta Machine Co.	—
Metal & Thermit Corp.	—
Midvale Co., The	—
Milne, A., & Co.	—
Missouri Rolling Mill Corp.	—
Moltrup Steel Products Co.	—
Monitor Controller Co.	—
Morgan Construction Co.	—
Morgan Engineering Co.	—
Murray Iron Works Co.	86
Mystic Iron Works	—
Mystic Steamship Company	—
N	
National Alloy Steel Co.	—
National Bearing Metals Corp.	—
National Forge & Ordnance Co.	—
National Lead Co.	—
National Lumber & Creosoting Co.	—
National Roll & Foundry Co.	—
National Steel Corp.	6, 76
National Telephone Supply Co., Inc.	—
National Tube Co.	46, 47
New England Coal & Coke Co.	—
New Jersey Zinc Co.	25
New York & New Jersey Lubricant Co.	—
Niagara Machine & Tool Works	83
Nicholson File Co.	—
Niles Steel Products Div., Republic Steel Corp.	—
Norma-Hoffmann Bearings Corp.	—
North American Manufacturing Co.	—
Norton Co., The	—
O	
Ohio Electric Mfg. Co.	86
Ohio Ferro-Alloys Corp.	—
Ohio Locomotive Crane Co.	85
Oliver Iron & Steel Corp.	79
Oxweld Acetylene Co.	—
P	
Parker-Kalon Corp.	—
Parkin, Wm. M., Co.	—
Penn Galvanizing Co.	—
Pennsylvania Industrial Engineers	85
Pennsylvania Salt Mfg. Co.	—
Peoria Malleable Castings Co.	86
Perkins, B. F., & Son, Inc.	—
Petroleum Iron Works Co.	—
Philadelphia Gear Works	—
Pittsburgh Crushed Steel Co.	—
Pittsburgh Lectromelt Furnace Corp.	—
Pittsburgh Rolls Corp.	—
Pittsburgh Steel Co.	—
Poole Foundry & Machine Co.	—
Porter, H. K., Co.	—
Power Piping Corp.	—
Precision Metal Workers	81
Pressed Steel Tank Co.	—
Prest-O-Lite Co., Inc., The	—
Progressive Mfg. Co.	—
Pure Oil Co., The	—
Q	
Quigley Co., Inc.	—
R	
Raymond Mfg. Co., Division of Associated Spring Corp.	—
Republic Steel Corp.	—
Rhoades, R. W., Metaline Co., Inc.	—
Riverside Foundry & Galvanizing Co.	—
Roebling's John A., Sons Co.	—
Ross, J. O., Engineering Co.	—
Ruby Chemical Co., The	—
Russell, Burdsall & Ward Bolt & Nut Co.	—
Ryerson, Joseph T., & Son, Inc.	86
S	
St. Joseph Lead Co.	—
Salem Engineering Co.	—
Samuel, Frank, & Co., Inc.	—
San Francisco Galvanizing Works	—
Sanitary Tinning Co., The	—
Scully-Jones & Co.	—
Scully Steel Products Co.	—
Semet-Solvay Engineering Corp.	—
Seneca Wire & Mfg. Co.	86
Shafer Bearing Corporation	—
Shaw-Box Crane & Hoist Division Manning, Maxwell & Moore, Inc.	—
Shell Union Oil Corporation	—
Shenango-Penn Mold Co.	—
Shepard Niles Crane & Hoist Corp.	—
Shuster, F. B., Co., The	—
Simonds Mfg. Co.	85
SKF Industries, Inc.	—
Sleeper & Hartley, Inc.	—
Smith, S. Morgan, Co.	—
Socony-Vacuum Oil Co., Inc.	—
Sojuzugleexport, Div., Amtorg Trading Corp.	73
Spowers, W. H., Jr.	—
Standard Galvanizing Co.	—
Standard Oil Co. of Indiana	—
Standard Steel Works Co.	—
Standard Tube Co.	85
Stanley Works	—
Starrett, L. S., Co., The	59
Stearns Magnetic Mfg. Co.	—
Steel & Tubes, Inc.	—
Stevens Hotel	—
Stonhard Company	—
Strong Steel Foundry Co.	—
Sun Oil Co.	—
Superior Steel Corp.	—
Surface Combustion Corp.	—
Sutton Engineering Co.	—
Syracuse Hotel	—
T	
Tar & Chemical Division of Koppers Co.	—
Taylor-Wilson Mfg. Co.	—
Tennessee Coal, Iron & Railroad Co.	46, 47
Thomas Machine Manufacturing Co.	—
Thomas Steel Co., The	—
Thomson-Gibb Electric Welding Co.	—
Tide Water Associated Oil Co.	—
Timken Roller Bearing Co.	—
Timken Steel & Tube Division, The Timken Roller Bearing Co.	10
Tinker, F., & Sons Co.	—
Tinnerman Stove & Range Co.	—
Toledo Stamping & Mfg. Co.	—
Tomkins-Johnson Co.	—
Torrington Co., The	—
Transue & Williams Steel Forging Corp.	—
Tri-Lok Co.	—
Truscon Steel Co.	—
U	
Union Carbide & Carbon Corp.	—
Union Carbide Sales Co.	—
Union Drawn Steel Div., Republic Steel Corp.	4, 5
Union Steel Castings Co.	—
United Engineering & Foundry Co.	42, 43
United States Rubber Products, Inc.	—
United States Steel Corp., Subsidiaries	46, 47
American Bridge Co.	
American Steel & Wire Co.	
Carnegie-Illinois Steel Corp.	
Columbia Steel Co.	
Cyclone Fence Co.	
National Tube Co.	
Scully Steel Products Co.	
Tennessee Coal, Iron & Railroad Co.	
Universal Atlas Cement Co.	
United States Steel Products Co.	46, 47
V	
Valley Mould & Iron Corp.	Front Cover
Vanadium Alloys Steel Co.	—
Vanadium Corp. of America	—
W	
Wagner Electric Corp.	—
Waldron, John, Corp.	—
Wallace Supplies Mfg. Co.	—
Washburn Wire Co.	—
Washburn Wire Co., Inc.	—
Wean Engineering Co., Inc.	Back Cover
Weirton Steel Co.	6
Wellman-Smith Owens Eng. Corp., Ltd.	Back Cover
Western Gas Division of Koppers Co.	—
Westinghouse Electric & Mfg. Co.	—
Westinghouse Lamp Division, Westinghouse Electric & Mfg. Co.	—
West Penn Machinery Co.	—
West Steel Casting Co.	86
Whitehead Stamping Co.	—
White Tar Co. of New Jersey, Inc., The	—
Wickwire Brothers	—
Wickwire Spencer Steel Co.	—
Wiggins, John B., Co.	—
Wilcox, Crittenden & Co., Inc.	—
Wilcox-Rich Division, Eaton Mfg. Co.	—
Wilson, Lee, Engineering Co.	Back Cover
Wilson Welder & Metals Co., Inc.	—
Witt Cornice Co., The	—
Wood Preserving Corp., The	—
Worthington Pump & Machinery Corp.	—
Worth Steel Co.	22
Wyckoff Drawn Steel Co.	—
Y	
Yale & Towne Mfg. Co.	—
Youngstown Foundry & Machine Co.	—
Youngstown Sheet & Tube Co.	—
Z	
Zeh & Hahnemann Co.	—

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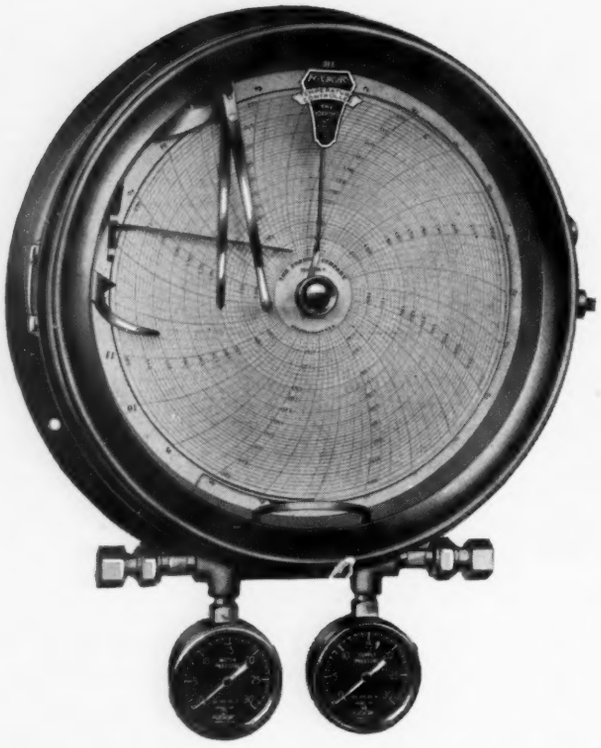

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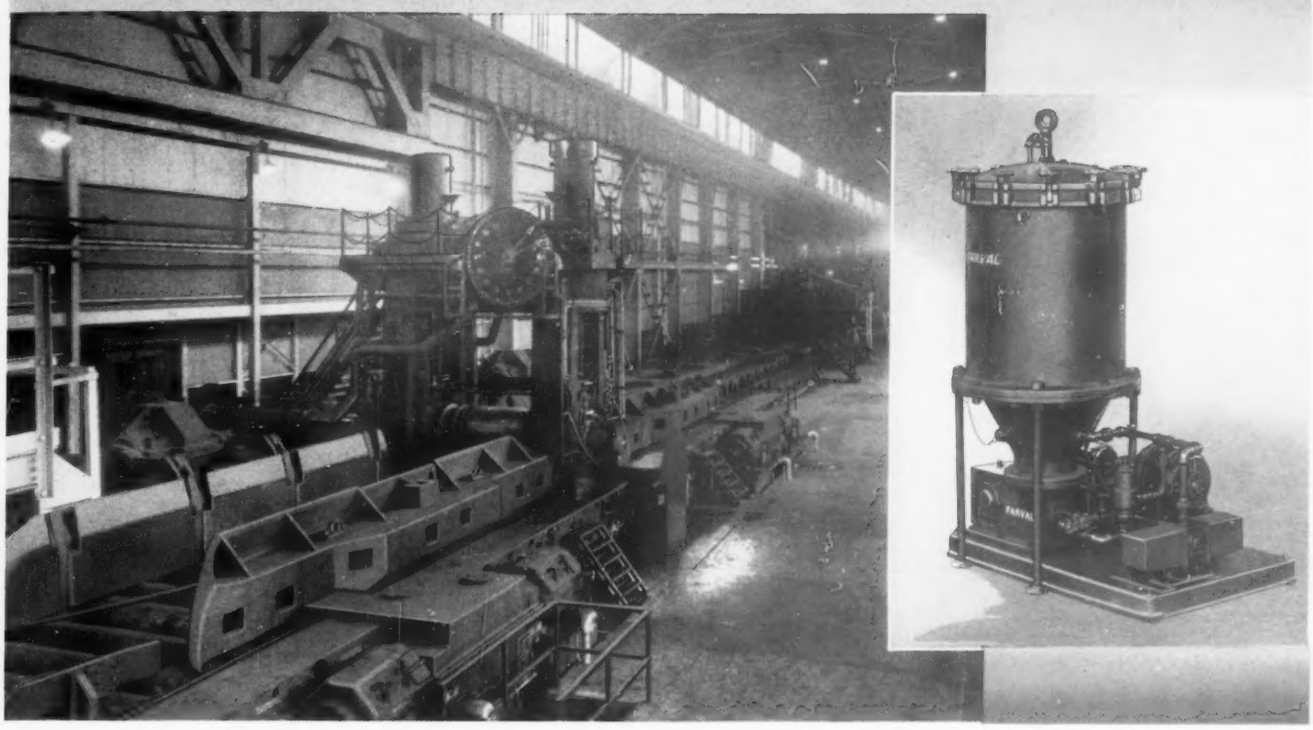

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